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Ms. Margaret Gielniewski
Remedial Project Manager
USEPA, Region 5
77 W. Jackson Boulevard
Chicago, Illinois 60604-3590

April 30, 2012
(1530)

RE: Response to USEPA's March 14, 2012 Comments on the Supplemental RI Activities
Manitowoc Former Manufactured Gas Plant (MGP) Site, Manitowoc, Wisconsin
Wisconsin Public Service Corporation
WIN000509949

Dear Ms. Gielniewski:

This letter provides responses to United States Environmental Protection Agency (USEPA) comments issued March 14, 2012 on the Supplemental RI Activities as presented in *Technical Memorandum No. 3 (Revision 1)*, submitted January 30, 2012. *Technical Memorandum No. 3 (Revision 2)* incorporating these responses is attached.

For ease of review, USEPA's comments are provided (italicized and indented) and followed by the response to comment.

Comments

1. *A table presenting the derivation of the groundwater screening levels for protection of indoor air was not provided.*

Response:

The derivation of the groundwater vapor intrusion (VI) screening values (SL) is provided on page 5 of the Risk Assessment Framework (RAF) Addendum (Exponent 2011).

2. *The ethylbenzene screening level (700 micrograms per liter [µg/L]) presented in Table 3, Groundwater Screening for Vapor Intrusion Evaluation, appears to be calculated incorrectly. Using the lower of the cancer-based groundwater screening level and the non-cancer-based groundwater screening level and applying the groundwater temperature-adjusted Henry's Law Constant and the default attenuation factor, the screening level should be 15.2 µg/L instead. This change affects the screening results at a few wells/piezometers.*

Response:

For those compounds that have an MCL, if the risk-based calculated groundwater VI SL was less than the MCL, then the MCL was used. This follows one of the three conventions that were adopted from U.S. EPA 2002 and were listed on page 6 of the RAF Addendum. However, in review of the RAF Addendum, the wording of this convention was not correct, even though the convention was applied correctly to select groundwater VI SLs. The wording of the third convention in the RAF addendum currently reads as:

- If the calculated groundwater vapor intrusion screening level exceeded the MCL, the MCL was used.

The wording of the third convention in the RAF addendum should read as:

- If the calculated groundwater vapor intrusion screening level was less than the MCL, then the MCL was used.

While the third convention was not worded properly, the convention was applied properly to develop the groundwater VI SL for ethylbenzene. In the case of ethylbenzene, the risk-based groundwater VI SL calculated using a target cancer risk of $1x10^{-6}$ was 15.2 ug/L, so the MCL (700 ug/L) was used as the groundwater VI SL (refer to Table 7 of the RAF Addendum). The MCL was also used for the groundwater VI SL in Table 8 of the RAF addendum, which represents values for the $1x10^{-5}$ target cancer risk. In table 9 of the RAF addendum, the groundwater VI SL for ethylbenzene is 1,520 ug/L, because the risk-based groundwater concentration is greater than the MCL.

3. *The proposed soil gas sampling depth of 3 feet should be increased to 5 feet around the Winter Building and small building north of the Winter Building at locations where pavement is not present to avoid dilution by ambient air. This soil gas depth is consistent with guidance provided in USEPA's Office of Solid Waste and Emergency Response Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (2002) and ITRC Vapor Intrusion Pathway: A Practical Guideline (2007).*

    a. *Please include this information in Attachment (3) of the Tier 1 and Tier 2 Soil Vapor Assessment:*

        i. *Does the Winter building have a basement?*

        ii. *Are the office spaces below grade?*

        iii. *Is there a sump pump that could be sampled to show if the foundation drainage system is impacted?*

    b. *We may need to establish a contingency plan if vapor and subslab results are elevated and more data collection is quickly needed or a vapor mitigation systems should be installed. If we have something in writing that is approved in advance of the Supplemental RI activities, we may be able to take action without writing a new work plan and waiting for Agency approval.*

Response:

As suggested, the shallow soil gas sampling depth was increased from 3 feet to 4.5 feet (top of 0.5 foot screen) in the grass areas around the Winter Building and small building to the north of the Winter Building. Although we do not necessarily agree that the sample will be diluted by ambient air, the increased depth minimizes possible effects from the atmosphere (i.e., temporal effects). At this depth, a 3-foot separation will be maintained between the shallow sample depth and the deep sample depth (7.5 feet-bottom of gas holder) for locations outside the gas holder (SV110, SV111, SV120, and SV121), which is desirable for determining vertical attenuation trends in soil gas concentrations. However, for the two locations inside the holder (SV107 and SV109) where the deep sample depth (6 feet) is likely limited by the perched water in the holder, the separation may only be approximately 1.5 feet. The document, including Table 6, was revised to reflect this increased sample depth.

a. We have included the following information in Enclosure B, Attachment (3) of the Tier 1 and Tier 2 Soil Vapor Assessment.

i. The Winter building does not have a basement.

ii. There are no offices spaces below grade.

iii. There is no sump pump that could be sampled.

b. We agree with the comment and have included the following contingency plan into the document.

Supplemental Actions for Potential Soil Vapor Evaluation

To determine if more immediate supplemental actions are warranted, initial soil vapor data will be evaluated to determine if vapor concentrations are of concern (i.e. initial samples evaluating a particular building exceed subslab/shallow soil gas screening levels for industrial land use, cancer risk 10^{-6}). Criteria for these supplemental actions were developed on a site-specific basis, and consider the proximity of the buildings to source areas and the number of sampling locations. A plan for these actions includes the following steps, consistent with the multi-site approach for vapor intrusion pathway evaluation:

1. Take immediate action to collect a second round of samples from the existing probes to confirm the initial vapor concentrations.

2. If vapor concentrations of MGP-related constituents are confirmed to be of concern (i.e. more than one sample evaluating a particular building exceeds subslab/shallow soil gas screening levels for industrial land use, cancer risk 10^{-6}), install and sample subslab probes in the building of concern that does not already have subslab samples. Confirm these concentrations with two rounds of data.

3. If vapor concentrations of MGP-related constituents are confirmed to be of concern in subslab samples (i.e. exceed subslab/shallow soil gas screening levels for industrial land use, cancer risk 10^{-6}), a site-specific risk assessment would be performed for the particular building to evaluate the data and determine appropriate next steps.

IBS will inform USEPA of the results prior to proceeding to the next step of the supplemental actions.

4. *The last sentence of the technical memorandum states, "The results of the additional assessment will be included in the RI Report and will inform the need for risk management tools (i.e., institutional controls)." The sentence should be reworded because the results of the vapor intrusion study will be used to determine the need for further evaluation of the vapor intrusion pathway (for example, sampling indoor air and sampling additional buildings), engineering controls, and institutional controls.*

Response:

The last sentence of the document was reworded as follows: The results of the vapor intrusion study will be used to determine the need for further evaluation of the vapor intrusion pathway and will be included in the RI Report.

Please contact Mr. Naren Prasad of IBS at 312.240.4569 if you should have any questions or require additional information.

Sincerely,

NATURAL RESOURCE TECHNOLOGY, INC.

Julie A. Zimdars, PE
Project Manager

Attachments: *Technical Memorandum No. 3 (Revision 2) - Supplemental RI Activities, dated April 30, 2012 (hard copy and CD copy)*

cc: Ms. Annette Weissbach, WDNR (hard copy and CD copy)
Ms. Catherine Schripsema, USEPA contractor (CD copy)
Mr. Mike Kierski, Exponent (via email)
Mr. Naren Prasad, IBS (CD copy)

[File:\1530 Response to March 14 2012 Suppl RI Comments FINAL]

TECHNICAL MEMORANDUM No. 3 (Revision 2)

Date: April 30, 2012

To: Margaret Gielniewski, USEPA Region 5

CC: Naren Prasad, Integrys Business Support
Annette Weissbach, WDNR
Catherine Schripsema, CH2M Hill

From: Julie Zimdars and Jennifer Kahler, Natural Resource Technology, Inc.

Subject: Supplemental RI Activities
Wisconsin Public Service Corporation's Former Manitowoc MGP Site
USEPA WIN000509949
BRRTS #: 02-36-000219

This Technical Memorandum (Revision 2) describes supplemental remedial investigation (RI) activities to be performed at the Wisconsin Public Service Corporation (WPSC) former Manitowoc Manufactured Gas Plant (MGP) facility, in accordance with the Administrative Order on Consent (AOC) and Statement of Work (SOW), Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Docket No. V W 06 C 847, dated May 5, 2006. Comments from the USEPA on the January 30, 2012 Technical Memorandum No. 3 (Revision 1) were received on March 14, 2012. Technical Memorandum No. 3 (Revision 2) incorporates these responses to comments as well as responses to prior comments received. Prior comments from the USEPA on the July 14, 2010 Technical Memorandum No. 3 (Revision 0), were received December 13, 2010. Responses to these comments were submitted January 28, 2011 and are included in Enclosure C to this memorandum. Also incorporated in this memorandum are the responses to critical issues received September 14, 2011 and further discussed in a conference call with USEPA on September 28, 2011. A Conditional Approval of the supplemental RI activities was received from USEPA on November 10, 2011 and is included in Enclosure D.

Upland RI soil borings, test pit exploration, and well installations were conducted in September 2009 in accordance with Site-Specific Work Plan (SSWP) – Revision 1 (NRT, April 2008). Specifically, twenty-six soil borings (SB100 -SB125), one test pit (TP101), and six piezometers were installed (PZ07B, PZ18TB, PZ23B, PZ24, PZ25, and PZ26) in the locations shown on Figure 1. Soil borings SB100, SB101 and SB102 were converted to PZ24, PZ25 and PZ26. The pertinent soil boring logs concerning Supplemental RI Activities are provided in Enclosure A.

The soil analytical results collected during 2009 and prior activities are provided on Table 1 (Petroleum Volatile Organic Compounds [PVOCs], Metals and Cyanide) and Table 2 (Polynuclear Aromatic Hydrocarbons [PAHs]) and are compared to the current USEPA Regional Screening Levels (RSLs) for

soil in an industrial setting. Similarly, the groundwater analytical results collected to date are provided on Table 3 (PVOCs, Metals and Cyanide) and Table 4 (PAHs) and are compared to groundwater screening levels for vapor intrusion obtained using the current USEPA RSLs protective of indoor air in an industrial setting.

The following supplemental RI activities are proposed including:

1. Installation of soil vapor probes and soil vapor sampling in the vicinity of the buildings of interest, and the Chicago Street utility corridor;
2. Installation of additional soil borings and soil sampling on the Winter property and the property west of the Winter property to define the horizontal extent of elevated naphthalene concentrations in the soil at SB122. Additional soil borings will be installed in Chicago Street to further define the product/oily area in proximity to MW14 containing non-aqueous phase liquid (NAPL) as requested by USEPA; and
3. Installation of two additional groundwater monitoring wells including proposed monitoring well MW22 and upgradient piezometer PZ05. Well MW22 was originally proposed on Canadian National Railroad (formerly Wisconsin Central Railroad) property and based on USEPA comments, the well was moved to a location adjacent to the Braun Property. Also, an upgradient piezometer (PZ05) was requested by USEPA and will be nested with MW05.

Supplemental RI activities will be performed in accordance with the Multi-Site Health and Safety Plan – Revision 1 (NRT, August 2007), the site-specific information included in the SSWP – Revision 1, and the Multi-Site Field Sampling Plan (FSP) – Revision 4 (NRT, September 2008).

SOIL VAPOR SAMPLING

A soil vapor sampling plan was proposed in SSWP Revision 1. Following completion of the soil boring program in the vicinity of the buildings, the need for soil vapor sampling was to be confirmed. A tiered approach assessment was completed following USEPA's OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance), November 2002 (USEPA 2002 Guidance). The tiered approach assessment is provided in Enclosure B, and results of the assessment indicate the need for soil vapor sampling.

Deviations from the soil vapor sampling plan proposed in the SSWP Revision 1 are proposed in this memorandum:

- Sampling soil vapor at locations interior of the on-site Main Building rather than exterior;
- Sampling soil vapor near the small WPSC-owned building near the Winter property and near the building to the south of the Winter Building;
- Revised soil vapor sampling depths; and
- Sampling of soil vapor in Chicago Street to evaluate the potential for migration through the utility corridors and for evaluating the potential for vapor intrusion.

These deviations, are discussed further below and do not affect the data quality objectives presented in the SSWP Revision 1.

Soil Vapor Sampling Approach

Supplemental RI activities are proposed to evaluate potential vapor intrusion in the vicinity of the buildings of interest at or near the site, and includes installation of soil vapor probes and soil vapor sampling. Determination of the vapor sampling points is based on the location of the remaining source material in the vicinity of each building, soil types encountered adjacent to and below the building foundation, surface conditions, building construction, and layout of the buildings in relation to former MGP structures. Vadose zone soil concentrations in the vicinity of the Main Building and the Winter Building are provided on Figures 2A and 2B, respectively. The building south of the Winter Building is in close proximity to the 300,000 CF gas holder and would be considered a building of interest (within the 35-foot critical distance as discussed below). As stated in Enclosure B, vadose zone soil is considered the primary source of contamination at the site that may influence potential vapor intrusion.

Figure 3 illustrates the groundwater screening results for vapor intrusion evaluation. The groundwater concentrations provided on Figure 3 are those from 2007 through January 2010, and only include wells monitoring shallow groundwater quality. Since concentrations from more recent rounds are not significantly different, these concentrations are representative of current conditions. Specifically, benzene and naphthalene concentrations in shallow groundwater are compared to the groundwater screening levels for vapor intrusion evaluation (protection of indoor air for industrial land use). Occurrence of NAPL at MW14, typically as dense-phase, was also considered. Surrounding the estimated extent of groundwater concentrations that exceed vapor screening criteria, a critical distance of 35 feet was selected based on the WDNR vapor intrusion guidance (PUB-RR-800) and ASTM Standard Guide for Vapor Encroachment Screening on Property involved in Real Estate Transactions (E2600-10). Per the WDNR guidance, investigating the vapor intrusion pathway is appropriate when free-phase product with the potential for off-gassing vapors is present within 30 feet (horizontally or vertically) of a building foundation. The ASTM document cites 30 feet for a critical distance for dissolved petroleum hydrocarbon constituents.

Based on this evaluation, the five buildings of interest for vapor intrusion include the Main WPSC Building, the Winter Building, the small WPSC-owned building adjacent to the Winter property, the Braun Building and the building to the south of the Winter Building (Figure 3). Using residential groundwater screening levels for the vapor intrusion evaluation does not change the boundary line significantly. There are no existing residential buildings that would fall within the 35 foot critical distance. Based on the industrial zoning adjacent to the boundary area, a future proposed residential building would not be consistent with the zoning or land use.

Practical aspects of the WDNR guidance relating to the distinction between small commercial buildings versus large commercial/industrial buildings and the resulting attenuation factors that are applicable will be evaluated in the RI report. For instance, the vapor attenuation factor may be reduced by a factor of 10

for a building categorized as a large commercial/industrial building (i.e. the Main WPSC Building) as compared to one categorized as a small commercial building (i.e. the Winter Building).

At each vapor sampling location, one to two soil vapor probes may be installed. Collecting soil vapor samples from a shallow and deep depth at a location will assist with assessing bioattenuation effects.

Soil Vapor Sampling Rationale and Locations

On-Property Main Building

Six soil vapor sampling locations are proposed within the footprint of the on-property Main Building, (Figure 4). Potential source material remains in the subsurface both inside and outside of the building footprint. Distribution is variable and may skew interpretation of soil vapor probe data; therefore, vapor sampling from within the Main Building footprint is recommended to best represent subgrade conditions considering the following site data:

- North side: Elevated concentrations of naphthalene, oil-wetted soils, staining and/or odors below the northwest corner of the Main Building, but not in soils exterior and adjacent to the building along the north side;
- South side: Higher frequency of elevated concentrations of naphthalene, oil-wetted soils, staining and/or odors in samples outside the building footprint than inside the building footprint; and
- Variable soil type: Two borings located outside the north edge and one boring located outside the south edge of the Main Building contained clay between 3.3 and 8.5 feet below ground surface (bgs), while the soil underneath the building is generally sand and fill.

Soil vapor sampling locations SV101 through SV106 are proposed in the interior of the Main Building near previously collected boring locations SB106 through SB113, and SB114 (located outside the building but on the perimeter of the holder). SV102 and SV105 are located close to the former gas holder perimeter where contamination is expected to be highest based on soil borings SB108 and SB114. Paired probes will be installed to sample vapors at two depths at each location (Table 6); one probe directly below the building floor slab (sub-slab), and one probe approximately one foot above the water table (expected to be 6 feet below the floor elevation). Depending on the depth at which groundwater is encountered, probe depths may require adjustment such that soil vapor samples are collected from the unsaturated zone.

Although NAPL is present in well MW14 near the southwest corner of the Main Building, the area is isolated from the Main Building by a stabilized soil area extending to 40 feet in depth, also shown on Figure 3. Given this layout, the proposed locations SV101 through SV106 will sufficiently represent vapor conditions under the building.

Winter Building and Vicinity

Four soil vapor sampling locations are proposed for the area around the Winter Building to estimate soil vapor concentrations beneath the Winter Building (Figure 4). Evidence of source material, in the form of elevated concentrations of benzene and naphthalene and strong odors, has been identified in the

subsurface within the former gas holder boundary. Since the Winter Building lies within the gas holder footprint, the holder bottom appears to be intact, and soil type appears to be homogenous in this area, vapor sampling from results locations within the gas holder footprint outside the building is expected to be representative of conditions beneath the building. Sampling locations SV107, SV108, SV109 and SV112 are proposed for collecting soil vapor within the former gas holder footprint and outside of the Winter Building. Sampling locations SV107, SV108 and SV109 correspond to soil borings SB122, SB123 and SB124, respectively, collected in the same areas. Locations SV108 and SV112 are in the asphalt capped area on the east side of the Winter Building, which represent conditions similar to those under the building slab. Soil vapor samples will be collected within approximately 10 feet of the Winter Building edge and at two depths above the gas holder base. The gas holder base is anticipated to be at 7.5 feet bgs; samples will be collected at 3 and 6 feet bgs (Table 6) at SV108 and SV112 (asphalt area). Samples will be collected at 4.5 feet and 6 feet bgs (Table 6) at SV107 and SV109 (grass area). The shallow sample depth was increased to 4.5 feet in non-paved areas to minimize possible effects from the atmosphere.

The highest concentrations of naphthalene, with strong odors, were identified in fill material at SB122 just outside the gas holder footprint to the northwest of the Winter Building. By collecting a soil vapor sample at location SV107, within the gas holder footprint and near the location of soil boring SB122, any impact to soil vapor beneath the Winter Building due to migration of vapor from this naphthalene source will be captured.

Soil vapor locations SV110 and SV111 will be installed around the small building north of the Winter Building (Figure 4). Probes will be located at the southeast and northwest corners of the building, in non-paved areas. Paired probes will be installed at each location; one at 4.5 feet bgs, and one approximately 7.5 feet bgs, which is the depth of adjacent former gas holder base (Table 6).

Soil vapor locations SV120 and SV121 will be installed on the Winter property along the south property line in non-paved areas, and outside the gas holder, to evaluate potential vapor intrusion into the building to the south (Figure 4). Probes will be located near the northeast and northwest corners of the building. Paired probes will be installed at each location; one at 4.5 feet bgs, and one approximately 7.5 feet bgs, which is the depth of adjacent former gas holder base (Table 6).

Chicago Street Utility Corridor and Braun Building

Seven soil vapor sampling locations (SV113 through SV119) are proposed to be installed for a vapor study in the vicinity of 11th Street and Chicago Street (Figure 4).

The northeast corner of the Braun building is within the 35 ft radius of the vapor intrusion groundwater screening level boundary (Figure 3). The potential for vapor intrusion to the Braun building will be evaluated with vapor sampling locations SV114 and SV115 (Figure 4), both located in the City right-of-way in close proximity to the Braun building. SV113 will also be located in the City right-of-way. This

location is in close proximity to the 35 ft radius line and the building on the southeast corner of Chicago and 11th Street. Two probes will be installed at SV113, SV114 and SV115; one probe at 3 feet bgs and one probe approximately 8 feet bgs.

As mentioned in Enclosure B, preferential pathways for soil vapor migration outside of the identified areas of contamination through utility corridors are not likely based on site characteristics. The vadose zone in much of the site is composed of fill (sand) and native sand. However, because there are isolated clay layers in certain areas within Chicago Street, and to address USEPA's comment, a limited vapor study will be performed. The study will include soil gas samples within the utility corridor in conjunction with soil borings to further define soil impacts in Chicago Street. Borings/probes will be located where utilities will not be damaged and safety will be a priority. Vapor sample locations SV115 to SV118 will be in close proximity to the MW14 NAPL/product area, and will target the permeable backfill of the storm inlets/manhole and sanitary manhole. One vapor probe will be installed at each location at the approximate depth of the utility. Based on sampling results, if determined necessary, additional probes may be installed radiating outward from these manholes/inlets to manholes at greater distances in the corridor.

Vapor probe locations SV113 through SV119 will require a permit from the City of Manitowoc to install the probes in the City right-of-way. Similar permits were obtained for previous boring and well installations in the right-of-way.

Soil Vapor Probe Installation and Sampling Methods

Soil vapor probes are proposed to be installed as semi-permanent probes with flush mount covers such that they can be sampled more than one time in order to assess data validity and temporal/seasonal effects, with the exception of vapor locations SV116 through SV119 in Chicago Street. These locations will be one-time samples. The probes will be installed in accordance with FSP, Appendix A, standard operating procedure (SOP) No. SAS-11-03 using direct push techniques. The probe will consist of ¼-inch diameter teflon tubing connected to a ¼-inch diameter, 0.5-foot long stainless steel screen with proper filter pack and bentonite grout seal. Paired probes will be nested within the same borehole with bentonite placed between the screens/filter packs for the collection of samples at two depths at each location.

During soil vapor probe installation, samples of the subsurface soil will be collected for grain size analysis, bulk density, specific gravity of soil solids, and moisture content for use in the soil vapor risk assessment. Because the subsurface soil characteristics are expected to be similar, up to three borings will be selected for the additional analysis. If site conditions indicate the soil characteristics are not sufficiently represented with three borings, additional borings may be selected.

Active soil vapor sampling will be performed, which involves extracting a volume of soil vapor and analyzing the resulting vapor sample. Samples will be collected in Summa canisters supplied and certified by the laboratory to ensure cleanliness. The size of the canister used for sampling will be determined by comparing laboratory reporting limits with screening criteria. Samples will be collected according to the procedures and methods described in the FSP, Appendix A, SOP Nos. SAS-11-04 (probe sampling) and SAS-11-01 (sub-slab sampling) including proper purge volume, sample collection, flow rate, and vacuum requirements. Leak detection testing will be conducted using the direct method as described in the above SOPs, including the use of a helium tracer gas and field screening to detect presence of helium in the soil vapor samples.

Probes will be abandoned when no further sampling is deemed necessary.

Soil Vapor Sample Analysis

Soil vapor samples will be submitted under chain-of-custody procedures, as described in Section 6 of the Multi-Site FSP, Revision 4, to an approved analytical laboratory.

A sampling and analysis plan summary is provided in Table 7. The chemicals of potential concern (COPC) list for soil vapor includes those chemicals related to the MGP site that have established vapor screening criteria based on the USEPA RSLs, which generally meet specific criteria for volatility and toxicity. More specifically, the COPCs are those parameters that were either detected in vadose zone soil (and have established vapor screening criteria), or in groundwater at concentrations above the groundwater screening levels for vapor intrusion (Tables 3 and 4). The COPCs to be analyzed include benzene, toluene, ethylbenzene and xylenes (BTEX), 1,2,4-trimethylbenzene and naphthalene. These chemicals are consistent with those presented in the Multi-Site Risk Assessment Framework Addendum for Former Manufactured Gas Plant Sites (MGPs) prepared by Exponent, dated April 14, 2011. Further details of the rationale for analysis of these parameters are provided in Enclosure B, Attachment 2. Samples will also be analyzed for oxygen, carbon dioxide, and methane for vertical profiling to assess bioattenuation.

Supplemental Actions for Potential Soil Vapor Evaluation

To determine if more immediate supplemental actions are warranted, initial soil vapor data will be evaluated to determine if vapor concentrations are of concern (i.e. initial samples evaluating a particular building exceed subslab/shallow soil gas screening levels for industrial land use, cancer risk 10^{-6}). Criteria for these supplemental actions were developed on a site-specific basis, and consider the proximity of the buildings to source areas and the number of sampling locations. A plan for these actions includes the following steps, consistent with the multi-site approach for vapor intrusion pathway evaluation:

1. Take immediate action to collect a second round of samples from the existing probes to confirm the initial vapor concentrations.
2. If vapor concentrations of MGP-related constituents are confirmed to be of concern (i.e. more than one sample evaluating a particular building exceeds subslab/shallow soil gas screening levels for industrial land use, cancer risk 10^{-6}), install and sample subslab probes in the building of concern that does not already have subslab samples. Confirm these concentrations with two rounds of data.
3. If vapor concentrations of MGP-related constituents are confirmed to be of concern in subslab samples (i.e. exceed subslab/shallow soil gas screening levels for industrial land use, cancer risk 10^{-6}), a site-specific risk assessment would be performed for the particular building to evaluate the data and determine appropriate next steps.

IBS will inform USEPA of the results prior to proceeding to the next step of the supplemental actions.

SOIL BORINGS

Two areas of additional soil borings are proposed (Figure 5) and the rationale for completing these borings is summarized below:

1. Along the western Winter property line, and possibly on the property to the west, to define the horizontal extent of elevated naphthalene concentrations at SB122. Fill containing what appeared to be crystallized naphthalene was identified at this boring. Based on visual and olfactory observations and analytical data, the highest concentrations are present at depths between 7.5 ft and 15 ft (refer to Table 1 and 2 for the analytical results of SB122 at depth of 12 to 14 ft).
2. In Chicago Street to further define the product/oily area in proximity to MW14 containing NAPL and provide updated soil analytical data.

Soil Boring Approach

Soil borings will be completed to define the lateral extent of MGP residuals (i.e. naphthalene-containing fill or NAPL) using a dynamic sampling/location selection approach as discussed below.

Soil Boring Rationale and Locations

Integrys has obtained an access agreement to advance borings on the adjacent property west of the Winter property (owned by 306 N. 10th Street LLC). In the event field observations from soil borings along the property line indicate MGP residuals potentially extend on to the adjacent property, then soil borings will be advanced on the adjacent property.

Soil boring locations SB126 and SB127 (shown on Figure 5) are general locations and may be refined based on utility clearance and conditions that may be associated with the aforementioned access agreement. If necessary to define the extent, additional borings will be installed in the approximate locations further west of these two locations. Locations of the additional borings may vary depending on field observations. Boring SB119 defines the northern extent of the soil contamination which did not indicate odors or elevated naphthalene concentrations to the depth of the boring at 20 ft (refer to Table 2).

Soil boring location SB128 will be performed east of SB-96-7 as requested by USEPA. Additional boring locations SB129 and SB130 will also be performed in this area to potentially further define the oily/product area in Chicago Street and provide updated soil analytical data in Chicago Street. All three borings will be advanced to 40 ft bgs or greater, as oily impacts were noted at SB-96-7 to this depth. Soil boring locations SB128, SB129 and SB130 require a City of Manitowoc permit to install the borings in the City right-of-way, similar to the permit obtained for previous work in the right-of-way.

Installation, Sampling Methods and Analyses

The soil boring installation, soil sampling methods and analyses will be in accordance with the SSWP-Revision 1, Section 6.4.

WELL INSTALLATIONS

Two additional wells will be installed as shown on Figure 6. The current groundwater elevation summary is provided in Table 5. The proposed wells and their rationale for installation are described below:

1. Monitoring well MW22 will be installed adjacent to the Braun Property, in the City right-of-way, to further define the extent of dissolved MGP constituents, particularly benzene and naphthalene, in the western portion of the site (Figure 6). This water table monitoring well will have 10-foot screen. Considering the groundwater table is approximately 13 feet bgs in this area, the well is proposed to be screened from approximately 10 to 20 ft bgs (elevation 584 to 574 ft).
2. Piezometer PZ05 will be nested with MW05 to confirm flow direction, vertical gradients, and groundwater quality at depth in the eastern, upgradient portion of the site (Figure 6). The surface elevation in the area of proposed PZ05 is 605 ft. The piezometer will be screened in the sand unit just above the till layer (if present) with a 5-foot screen. The piezometer will be installed to a depth of approximately 55 feet bgs, so the screened interval will be similar to the piezometers installed along the river in 2009 (approximately 550 ft). Also, the bottom of screen elevation of MW05 is approximately 575 ft, which would provide an approximate 25 foot screen separation.

Well location MW22 will require a City of Manitowoc permit to install the well in the City right-of-way.

Installation, Sampling Methods and Analyses

The well installation, well sampling methods and analyses will be in accordance with the SSWP-Revision 1, Section 6.6.

SCHEDULE

The supplemental RI investigation work was conditionally approved by USEPA on November 10, 2011. Pending the City's permit process, supplemental RI activities are proposed to be completed in Spring 2012. A second round of vapor sampling will be collected during late summer season. The results of the vapor intrusion study will be used to determine the need for further evaluation of the vapor intrusion pathway and will be included in the RI Report.

REFERENCES

ASTM International *Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactions* (ASTM E2600-10), published June 2010.

Exponent, *Multi-Site Risk Assessment Framework Addendum – Former Manufactured Gas Plant Sites*, April 14, 2011

Interstate Technology Regulatory Council, 2007. *Vapor Intrusion Pathway: A Practical Guideline*, January 2007.

Natural Resource Technology, Inc., 2008. *Remedial Investigation/Feasibility Study Site Specific Work Plan for the Former Manitowoc MGP Site*, Revision 1, April 2008.

Multi-Site Health and Safety Plan, Revision 2, August 2007.

Multi-Site Field Sampling Plan, Revision 4, September 2008.

Wisconsin Department of Natural Resources *Addressing Vapor Intrusion at Remediation and Redevelopment Sites in Wisconsin PUB-RR-800*, December 2010.

USEPA, 2002. *OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (EPA530-D-02-004),* November 2002.

ATTACHMENTS

Figure 1	RI Upland Boring and Well Locations (1530-153-B01)
Figure 2A	Vadose Zone Soil Sampling Results – Main Building (1530-153-B02aC)
Figure 2B	Vadose Zone Soil Sampling Results – Winter Building (1530-153-B02bC)
Figure 3	Groundwater Screening for Vapor Intrusion (VI) Evaluation (1530-153-B03C)
Figure 4	Proposed Soil Vapor Sampling Locations (1530-153-B04C)
Figure 5	Proposed Soil Boring Locations (1530-153-B05C)
Figure 6	Proposed Well/Piezometer Locations (1530-153-B06C)
Table 1	Soil Analytical Results – PVOCs, Metals and Cyanide
Table 2	Soil Analytical Results – PAHs
Table 3	Groundwater Screening for Vapor Intrusion Evaluation- PVOCs, Metals and Cyanide
Table 4	Groundwater Screening for Vapor Intrusion Evaluation – PAHs
Table 5	Groundwater Elevation Summary
Table 6	Proposed Soil Vapor Sampling Locations and Depths
Table 7	Sampling and Analysis Plan Summary for Soil Vapor Sampling
Enclosure A	Pertinent Soil Borings Logs
Enclosure B	Tier 1 and Tier 2 Soil Vapor Assessment Attachments: 1. Vapor Intrusion Pathway Summary Page 2. Initial Vapor Intrusion Screen for Integrys MGP sites including Table 1 3. Building Construction and Use Information
Enclosure C	NRT's Response to USEPA's December 13, 2010 Comments on the Supplemental RI Activities USEPA, submitted January 28, 2011
Enclosure D	Conditional Approval of the Technical Memorandum No. 3 entitled "Supplemental RI Activities–Former Wisconsin Public Service Corporation's Manitowoc Manufactured Gas Plant Site, Manitowoc, Wisconsin", dated November 9, 2011

FIGURES

N

0 30 60

SCALE IN FEET

Survey Datum:
Horizontal: Manitowoc County Coordinate System
Vertical: NAVD 1988

MANITOWOC RIVER FLOW

WISCONSIN CENTRAL PROPERTY

BRAUN BUILDING PROPERTY

NORTH 10th STREET

NORTH 11th STREET

CHICAGO STREET

WPSC PARCEL 000-120-080

BUILDING WPSC PARCEL 000-153-020

BLOCK 120

BLOCK 153

Original Plat of the City of Manitowoc

MW1 MW2 MW5 MW6 MW7 MW8 MW9 MW10 MW12D MW13 MW14 MW15T MW16T MW17T MW18T MW19T MW20T MW21T PW1 PZ7B PZ18TB PZ23B PZ24/SB-100 PZ25/SB-101 PZ26/SB-102 SG1 SB103 SB104 SB105 SB106 SB107 SB108 SB109 SB110 SB111 SB112 SB113 SB114 SB115 SB116 SB117 SB118 SB119 SB120 SB121 SB122 SB123 SB124 SB125 TP101A TP101B

Benchmark – Saw cut in top of sheet piling. Elevation = 585.22'

Benchmark – Tag bolt on hydrant. Elevation = 605.87'

Tax parcel ID Number (typ)

000-120-041 000-120-050 000-120-060 000-120-080 City of Manitowoc 000-153-030 000-153-010 Winter

WPSC Property Line (typ)

Steel sheet pile wall

Concrete

Asphalt Parking Lot

Air Handling Unit

Asphalt Parking Lot

Woods

Sidewalk

BUILDING

Canopy

Grate

Rim=602.86'

Rim=602.72'

X Floor Elev=589.66'

X Floor Elev=589.53'

X Floor Elev=602.41'

Top of conc. wall Elev = 599.2'

1 1/4" steel gas service

2" Plastic gas main

1/2" TRIPLE

5/8"

Landscaping

(GRASS)

(ASPHALT)

(CONCRETE)

Concrete

Asphalt

Sidewalk

SIGN

STORM 1

INLET 1

INLET 2

STORM 2

SAN 2

SAN 3

SAN 4 Unable to open

TIE-IN TO EXISTING SANITARY SEWER

3G0081 3G0086 3G0089 3G0091 3F0102

(BUILDING)

SOURCE NOTES:
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CARBON ABSORPTION PRETREATMENT LOCATION DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0107, DATED DECEMBER 1997.
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LEGEND

- MW7 — MONITORING WELL
- PZ24 — PIEZOMETER
- PZ23B — BEDROCK PIEZOMETER
- PW1 — PUMPING WELL
- SB103 — SOIL BORING (2009 RI)
- TP101A — TEST PIT (2009 RI)
- SG1 — STAFF GAUGE
- PROPERTY BOUNDARY
- EXISTING BUILDING W/IN SITE BOUNDARY
- APPROXIMATE EXTENT OF UPLAND SITE
- FENCE
- SHORELINE
- E — ELECTRIC LINE
- G — GAS LINE
- W — WATER MAIN
- SAN — SANITARY SEWER
- ST — STORM SEWER
- OE — OVERHEAD POWERLINE
- X — SHEET PILE WALL
- UTILITY POLE
- HYDRANT
- WATER VALVE/CURB STOP
- W — WATER MANHOLE
- SA — SANITARY MANHOLE
- S — STORM MANHOLE
- OPEN STORM MANHOLE
- STORM INLET

DRAWN BY: RLH	CHECKED BY: CJM	APPROVED BY: JAZ
DATE: 04/24/12	DATE: 04/24/12	DATE: 04/24/12

DRAWING NO: 1530-153-B01
REFERENCE: .

RI UPLAND BORING AND WELL LOCATIONS

TECHNICAL MEMORANDUM (REV. 2) - SUPPLEMENTAL RI
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/15.3

FIGURE NO. 1

Apr 27, 2012 11:53am PLOTTED BY: rhopkins SAVED BY: rhopkins
Y:\ACAData\Projects\15\1530 Manitowoc\15-3\TECH_MEMO_REV2\1530-153-B01.dwg Layout1
IMAGES:
XREFS:

SAMPLE LOCATION	NAPH	BEN
SAMPLE DEPTH	NAPHTHALENE (ug/kg)	BENZENE (ug/kg)
SOIL SCREENING LEVEL		
INDUSTRIAL SOIL SCREENING LEVEL (USEPA)	**18,000**	**5,400**

1,100,000 CONCENTRATION ATTAINS OR EXCEEDS THE INDUSTRIAL SOIL SCREENING LEVEL
ALL RESULTS IN MICROGRAMS PER KILOGRAM µg/kg
SEE FULL DATA TABLES FOR ACCOMPANYING DATA FLAGS AND QUALIFIERS.
<LESS THAN (DETECTION LIMIT STATED)
ND = NOT DETECTED
**SB58 LOCATION IS LIKELY IN STABILIZED SOIL AREA

SB108	NAPH	BEN
0-2	**27,500**	170
4-6	**100,000**	420

SB104	NAPH	BEN
4-6	260	<25

SB125	NAPH	BEN
0-2	422	42.1
6-8	110	64
10-12	230	42.6

SB105	NAPH	BEN
6-8	1.7	<25

SB107	NAPH	BEN
4-6	415	158

SB103	NAPH	BEN
4-6	210	<25

SB109	NAPH	BEN
8-10	21.1	<25

SB106	NAPH	BEN
4-8	**34,700**	217

SB110	NAPH	BEN
0-2	19.3	<25
4-6.5	15.3	<25

SB111	NAPH	BEN
0-2	192	<25
6-8	27.5	<25

SB4	NAPH	BEN
7.5-9	ND	ND

SB58**	NAPH	BEN
13-15	**3,200,000**	<50

TP101B	NAPH	BEN
13.5-13.5	2	<25

SB113	NAPH	BEN
0-2	1,970	<25
2-4	96.4	<25
8-10	31	<25

SB3	NAPH	BEN
16-17	**730,000**	**32,000**
16-17	COAL TARS	

SB115	NAPH	BEN
0-2	49.2	<25
10-12	24.8	<25
18-20	42	<25

SB118	NAPH	BEN
0-2	270	<25
6-8	59.5	<25
18-20	31.3	<25

TP101A	NAPH	BEN
17-17	5.2	<25

SB-96-7	NAPH	BEN
15-17	**1,100,000**	1,800

SB116	NAPH	BEN
0-2	1,540	38.5
14-16	23	<25

SB112	NAPH	BEN
4-6	11.6	<25
8-10	169	<25

SB117	NAPH	BEN
0-2	674	<25
12-14	210	<25

SB114	NAPH	BEN
0-2	2,870	53.3
8-10	953	44.5
12-14	522	<25
16-17	**4,470,000**	**144,000**

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WELL AND BORING POSITIONS WERE SURVEYED BY IBS SURVEY GROUP, SEPTEMBER 2009.

LEGEND
- SB1 — SOIL BORING (PRE-2009 RI)
- SB103 — SOIL BORING (2009 RI)
- TP101A — TEST PIT (2009 RI)
- SG1 — STAFF GAUGE
- PW1 — PUMPING WELL
- PROPERTY BOUNDARY
- FENCE
- SHORELINE
- ELECTRIC LINE
- GAS LINE
- WATER MAIN
- SANITARY SEWER
- STORM SEWER
- OVERHEAD POWERLINE
- SHEET PILE WALL
- EXISTING BUILDING W/IN SITE BOUNDARY
- APPROXIMATE EXTENT OF UPLAND SITE
- UTILITY POLE
- HYDRANT
- WATER VALVE/CURB STOP
- WATER MANHOLE
- SANITARY MANHOLE
- STORM MANHOLE
- OPEN STORM MANHOLE
- STORM INLET
- SOIL STABILIZED TO 32 FEET bgs (1993 AND 1994)
- SOIL STABILIZED TO 35 FEET bgs (1993)
- SOIL STABILIZED TO 40 FEET bgs (1993)
- JANUARY 1994 EXCAVATION AND DEPTH (FT)

N

0 30 60
SCALE IN FEET

Survey Datum:
Horizontal: Manitowoc County Coordinate System
Vertical: NAVD 1988

DRAWN BY: RLH DATE: 04/24/12
CHECKED BY: CJM DATE: 04/24/12
APPROVED BY: JAZ DATE: 04/24/12
DRAWING NO: 1530-153-B02AC
REFERENCE: P:\1500\1530\Reports\2010 VI Evaluation\Data\Soil Data

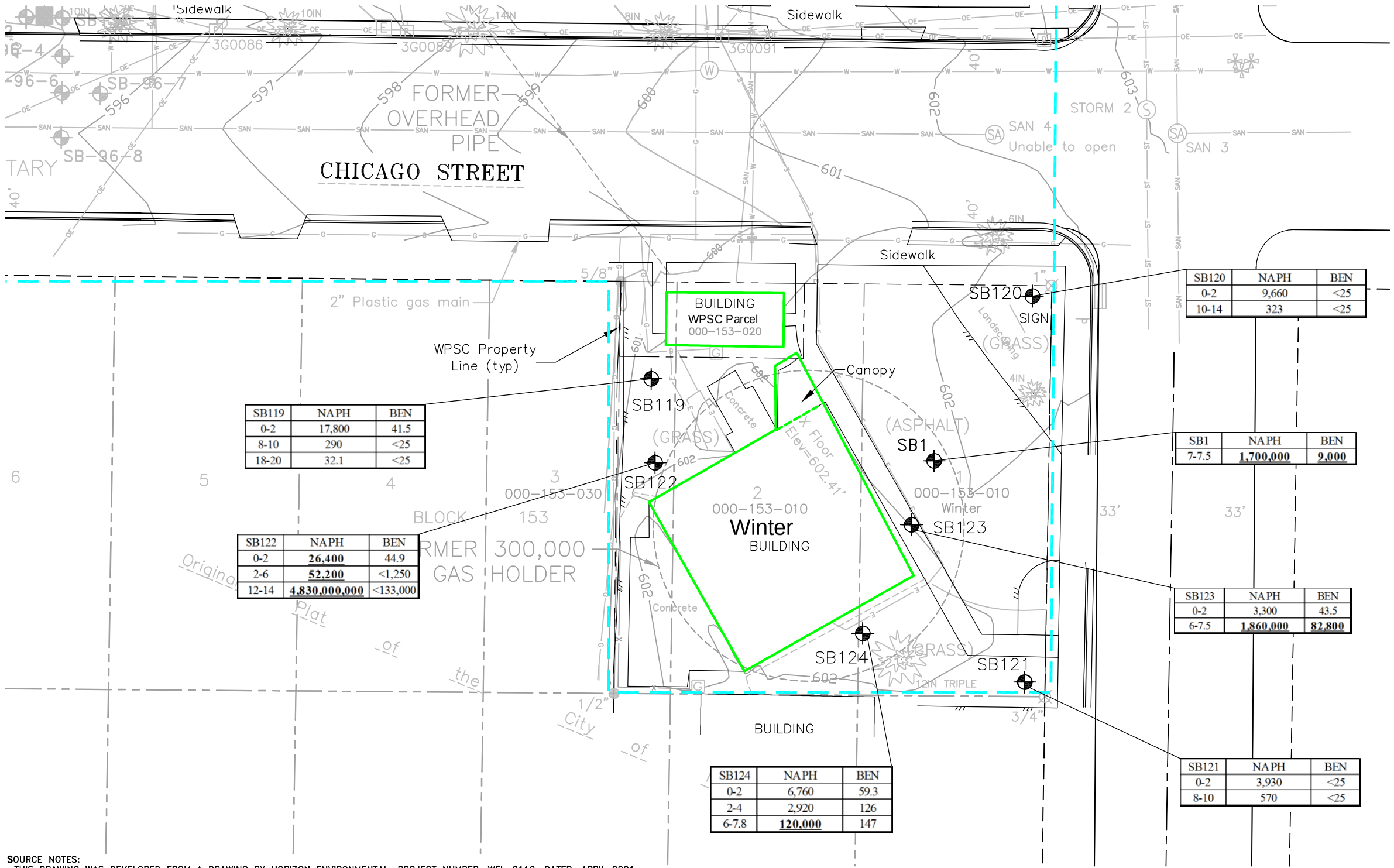
VADOSE ZONE SOIL SAMPLING RESULTS-MAIN BUILDING
TECHNICAL MEMORANDUM (REV. 2) - SUPPLEMENTAL RI
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/15.3

FIGURE NO. 2A

Apr 27, 2012 11:55am PLOTTED BY: rhopkins SAVED BY: rhopkins
Y:\ACADdata\Projects\15\1530 Manitowoc\15-3\TECH_MEMO_REV2\1530-153-B02A_C.dwg Layout1
IMAGES:
XREFS:



SB119	NAPH	BEN
0-2	17,800	41.5
8-10	290	<25
18-20	32.1	<25

SB122	NAPH	BEN
0-2	**26,400**	44.9
2-6	**52,200**	<1,250
12-14	**4,830,000,000**	<133,000

SB124	NAPH	BEN
0-2	6,760	59.3
2-4	2,920	126
6-7.8	**120,000**	147

SB120	NAPH	BEN
0-2	9,660	<25
10-14	323	<25

SB1	NAPH	BEN
7-7.5	**1,700,000**	**9,000**

SB123	NAPH	BEN
0-2	3,300	43.5
6-7.5	**1,860,000**	**82,800**

SB121	NAPH	BEN
0-2	3,930	<25
8-10	570	<25

LEGEND

- SB1 — SOIL BORING (PRE 2009 RI)
- SB119 — SOIL BORING (2009 RI)
- PROPERTY BOUNDARY
- FENCE
- EXISTING BUILDING W/IN SITE BOUNDARY
- APPROXIMATE EXTENT OF UPLAND SITE
- ELECTRIC LINE
- GAS LINE
- WATER MAIN
- SANITARY SEWER
- STORM SEWER
- OVERHEAD POWERLINE
- SHEET PILE WALL
- UTILITY POLE
- HYDRANT
- WATER VALVE/CURB STOP
- WATER MANHOLE
- SANITARY MANHOLE
- STORM MANHOLE
- OPEN STORM MANHOLE
- STORM INLET

N

0 15 30
SCALE IN FEET

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SAMPLE LOCATION	NAPH	BEN
SAMPLE DEPTH	NAPHTHALENE (ug/kg)	BENZENE (ug/kg)
SOIL SCREENING LEVEL		
INDUSTRIAL SOIL SCREENING LEVEL (USEPA)	**18,000**	**5,400**

1,700,000 CONCENTRATION ATTAINS OR EXCEEDS THE INDUSTRIAL SOIL SCREENING LEVEL
ALL RESULTS IN MICROGRAMS PER KILOGRAM µg/kg
SEE FULL DATA TABLES FOR ACCOMPANYING DATA FLAGS AND QUALIFIERS.
<LESS THAN (DETECTION LIMIT STATED)
ND = NOT DETECTED

Survey Datum:
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REFERENCE: P:\1500\1530\Reports\2010 VI Evaluation\Data\Soil Data

VADOSE ZONE SOIL SAMPLING RESULTS-WINTER BUILDING

TECHNICAL MEMORANDUM (REV. 2) - SUUPLEMENTAL RI
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/15.3

FIGURE NO. 2B

Apr 27, 2012 11:56am PLOTTED BY: rhopkins SAVED BY: rhopkins
Y:\ACAData\Projects\15\1530 Manitowoc\15-3\TECH_MEMO_REV2\1530-153-B02B_C.dwg Layout1
IMAGES:
XREFS:

SAMPLE LOCATION	NAPH	BEN
SAMPLE DATE	NAPHTHALENE	BENZENE
	(ug/L)	(ug/L)
GROUNDWATER SCREENING LEVEL FOR VI EVALUATION		
INDOOR AIR-INDUSTRIAL, CR=1X10^{-6}	**20**	**7.05**

764 CONCENTRATION ATTAINS OR EXCEEDS THE GROUNDWATER SCREENING LEVEL, PROTECTIVE OF INDOOR AIR-INDUSTRIAL.
ALL RESULTS IN MICROGRAMS PER LITER (UG/L).
SEE FULL DATA TABLES FOR ACCOMPANYING DATA FLAGS AND QUALIFIERS.
<LESS THAN (DETECTION LIMIT STATED)
ONLY WELLS MONITORING SHALLOW GROUNDWATER ARE USED FOR VAPOR INTRUSION (VI) EVALUATION

MW08	NAPH	BEN
5/16/2007	0.071	<0.14
10/26/2009	0.57	<0.23
01/27/2010	<0.047	<0.39

MW09	NAPH	BEN
5/16/2007	0.25	<0.14
10/26/2009	<0.17	<0.23
01/27/2010	<0.047	<0.39

MW07	NAPH	BEN
10/26/2009	<0.17	<0.23
01/27/2010	<0.049	<0.39

MW10	NAPH	BEN
5/16/2007	0.13	<0.14
10/26/2009	<0.17	<0.23
01/27/2010	0.071	<0.39

MW05	NAPH	BEN
5/16/2007	<6.2	<0.14
10/27/2009	<0.48	<0.23
01/27/2010	<0.047	<0.39

MW13	NAPH	BEN
5/16/2007	0.62	6.4
10/26/2009	**3540**	**764**
01/26/2010	<0.95	**696**

MW12	NAPH	BEN
10/27/2009	<1.9	<0.23
01/26/2010	<0.047	<0.39

MW14	NAPH	BEN
5/16/2007	Free Product In Well	
10/26/2009	Free Product In Well	
01/27/2010	Free Product In Well	

MW17T	NAPH	BEN
5/16/2007	<0.012	<0.14
10/26/2009	<0.17	<0.23
01/26/2010	<0.047	<0.39

MW02	NAPH	BEN
5/16/2007	0.12	2.3
10/27/2009	<0.48	5.3
01/27/2010	0.59	4.3

MW18T	NAPH	BEN
5/16/2007	<0.012	<0.14
10/26/2009	<0.17	<0.23
01/27/2010	0.056	<0.39

MW01	NAPH	BEN
5/16/2007	1.7	4.7
10/27/2009	<0.097	<0.23

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- MW11 — ABANDONED MONITORING WELL
- PW1 — PUMPING WELL
- PZ24 — PIEZOMETER
- PZ23B — BEDROCK PIEZOMETER
- EXISTING BUILDING W/IN SITE BOUNDARY
- APPROXIMATE EXTENT OF UPLAND SITE
- PROPERTY BOUNDARY
- APPROXIMATE EXTENT OF BENZENE AND NAPHTHALENE GROUNDWATER SCREENING LEVEL EXCEEDANCE FOR VI EVALUATION
- 35 FOOT RADIUS OF GROUNDWATER SCREENING LEVEL EXCEEDANCE
- FENCE
- SHORELINE
- ELECTRIC LINE
- GAS LINE
- WATER MAIN
- SANITARY SEWER
- STORM SEWER
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DRAWING NO: 1530-153-B03C
REFERENCE: W:\1500\1530\Reports\2010 GROUNDWATER SCREENING FOR VAPOR INTRUSION (VI) EVALUATION\Data\GW Data

GROUNDWATER SCREENING FOR VAPOR INTRUSION (VI) EVALUATION

TECHNICAL MEMORANDUM (REV. 2) – SUPPLEMENTAL RI
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/15.3

FIGURE NO. 3

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PROPOSED SOIL VAPOR SAMPLING LOCATIONS

TECHNICAL MEMORANDUM (REV. 2) – SUPPLEMENTAL RI
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

DRAWN BY:	RLH	DATE: 04/24/12
CHECKED BY:	CJM	DATE: 04/24/12
APPROVED BY:	JAZ	DATE: 04/24/12
DRAWING NO: 1530-153-B04C		
REFERENCE:		

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/15.3

FIGURE NO. 4

LEGEND

- SV107 — PROPOSED SOIL VAPOR PROBE
- MW7 — MONITORING WELL
- PZ24 — PIEZOMETER
- PZ23B — BEDROCK PIEZOMETER
- MW11 — ABANDONED MONITORING WELL
- PW1 — PUMPING WELL
- TP101B — TEST PIT (2009 RI)
- SB103 — SOIL BORING
- SG1 — STAFF GUAGE
- PROPERTY BOUNDARY
- EXISTING BUILDING W/IN SITE BOUNDARY
- APPROXIMATE EXTENT OF UPLAND SITE
- FENCE
- SHORELINE
- ELECTRIC LINE
- GAS LINE
- WATER MAIN
- SANITARY SEWER
- STORM SEWER
- OVERHEAD POWERLINE
- SHEET PILE WALL
- UTILITY POLE
- HYDRANT
- MANHOLE
- SANITARY MANHOLE
- STORM MANHOLE
- FORMER MGP STRUCTURES
- SOIL STABILIZED TO 32 FEET bgs (1993 AND 1994)
- SOIL STABILIZED TO 35 FEET bgs (1993)
- SOIL STABILIZED TO 40 FEET bgs (1993)
- 12' — JANUARY 1994 EXCAVATION AND DEPTH (FT)
- MGP — MANUFACTURED GAS PLANT

SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0110, DATED: APRIL 2001.
CARBON ABSORPTION PRETREATMENT LOCATION DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0107, DATED DECEMBER 1997.
ALL LOCATIONS ARE APPROXIMATE.
WELL POSITIONS SURVEYED BY WPSC SEPTEMBER 2003.
REMEDIATION AREA TAKEN FROM EARTH TECH DRAWING DATED MARCH 1995.
SURVEY COORDINATES FOR MW-15T, MW-16T AND SG-1 WERE PROVIDED BY WPSC, MAY 25, 2005.
BORING LOCATIONS SB1 THROUGH SB4 TAKEN FROM A DRAWING BY WW ENGINEERING AND SCIENCE, INC., PROJECT NUMBER: 22159, DATED DECEMBER 1991.
BORING LOCATIONS SB5 THROUGH SB58 TAKEN FROM A DRAWING BY WW ENGINEERING AND SCIENCE, INC., PROJECT NUMBER: 22319, DATED OCTOBER 1993.
BORING LOCATIONS SB95-1 THROUGH SB95-6 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, DATED AUGUST 1995.
BORING LOCATIONS SB-96-1 THROUGH SB-96-12 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, FIGURE 2, DATED DECEMBER 1996.
PROPERTY BOUNDARY 2001 TAKEN FROM A DRAWING BY SCHINDEL SURVEYING LLC, JOB NAME: WPSMAN1, DATED SEPTEMBER 3, 2001.
PROPERTY BOUNDARY 2002 AND RIVER BANK TAKEN FROM A DRAWING FROM BAY LAKES REGIONAL PLANNING COMMISSION, GREEN BAY, WI, DATED OCTOBER 30, 2002.
RIGHT OF WAYS AND CURBS APPROXIMATED FROM A DRAWING FROM BAY LAKES REGIONAL PLANNING COMMISSION, GREEN BAY, WI, DATED OCTOBER 30, 2002.
DRAWING FROM INTEGRYS BUSINESS SUPPORT, llc TOPOGRAPHIC SURVEY, DATED 01-19-10.
WELL AND BORING POSITIONS WERE SURVEYED BY IBS SURVEY GROUP, SEPTEMBER 2009.

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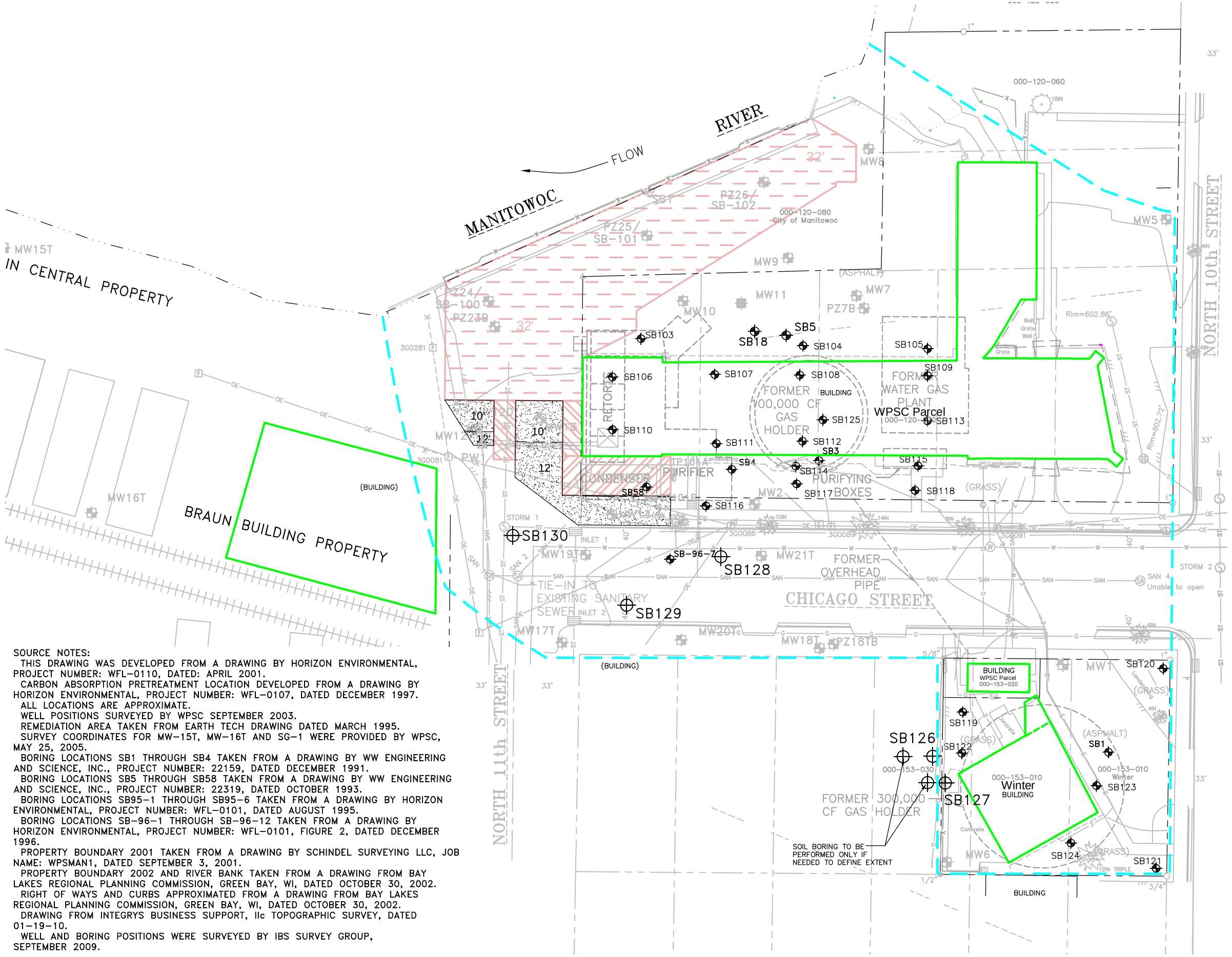
PROPOSED SOIL BORING LOCATIONS

TECHNICAL MEMORANDUM (REV. 2) – SUPPLEMENTAL RI
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

DRAWN BY:	RLH	DATE: 04/24/12
CHECKED BY:	CJM	DATE: 04/24/12
APPROVED BY:	JAZ	DATE: 04/24/12

DRAWING NO: 1530-153-B05C
REFERENCE:



LEGEND

SB126	PROPOSED SOIL BORING
MW7	MONITORING WELL
PZ24	PIEZOMETER
PZ23B	BEDROCK PIEZOMETER
MW11	ABANDONED MONITORING WELL
PW1	PUMPING WELL
TP101B	TEST PIT (2009 RI)
SB103	SOIL BORING
SG1	STAFF GUAGE
	PROPERTY BOUNDARY
	EXISTING BUILDING W/IN SITE BOUNDARY
	APPROXIMATE EXTENT OF UPLAND SITE
X	FENCE
	SHORELINE
E	ELECTRIC LINE
G	GAS LINE
W	WATER MAIN
SAN	SANITARY SEWER
ST	STORM SEWER
OE	OVERHEAD POWERLINE
X	SHEET PILE WALL
	UTILITY POLE
	HYDRANT
	MANHOLE
SA	SANITARY MANHOLE
S	STORM MANHOLE
	FORMER MGP STRUCTURES
32	SOIL STABILIZED TO 32 FEET bgs (1993 AND 1994)
35	SOIL STABILIZED TO 35 FEET bgs (1993)
40	SOIL STABILIZED TO 40 FEET bgs (1993)
12'	JANUARY 1994 EXCAVATION AND DEPTH (FT)
MGP	MANUFACTURED GAS PLANT

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BORING LOCATIONS SB95-1 THROUGH SB95-6 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, DATED AUGUST 1995.
BORING LOCATIONS SB-96-1 THROUGH SB-96-12 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, FIGURE 2, DATED DECEMBER 1996.
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WELL AND BORING POSITIONS WERE SURVEYED BY IBS SURVEY GROUP, SEPTEMBER 2009.

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1530/15.3

FIGURE NO.
5

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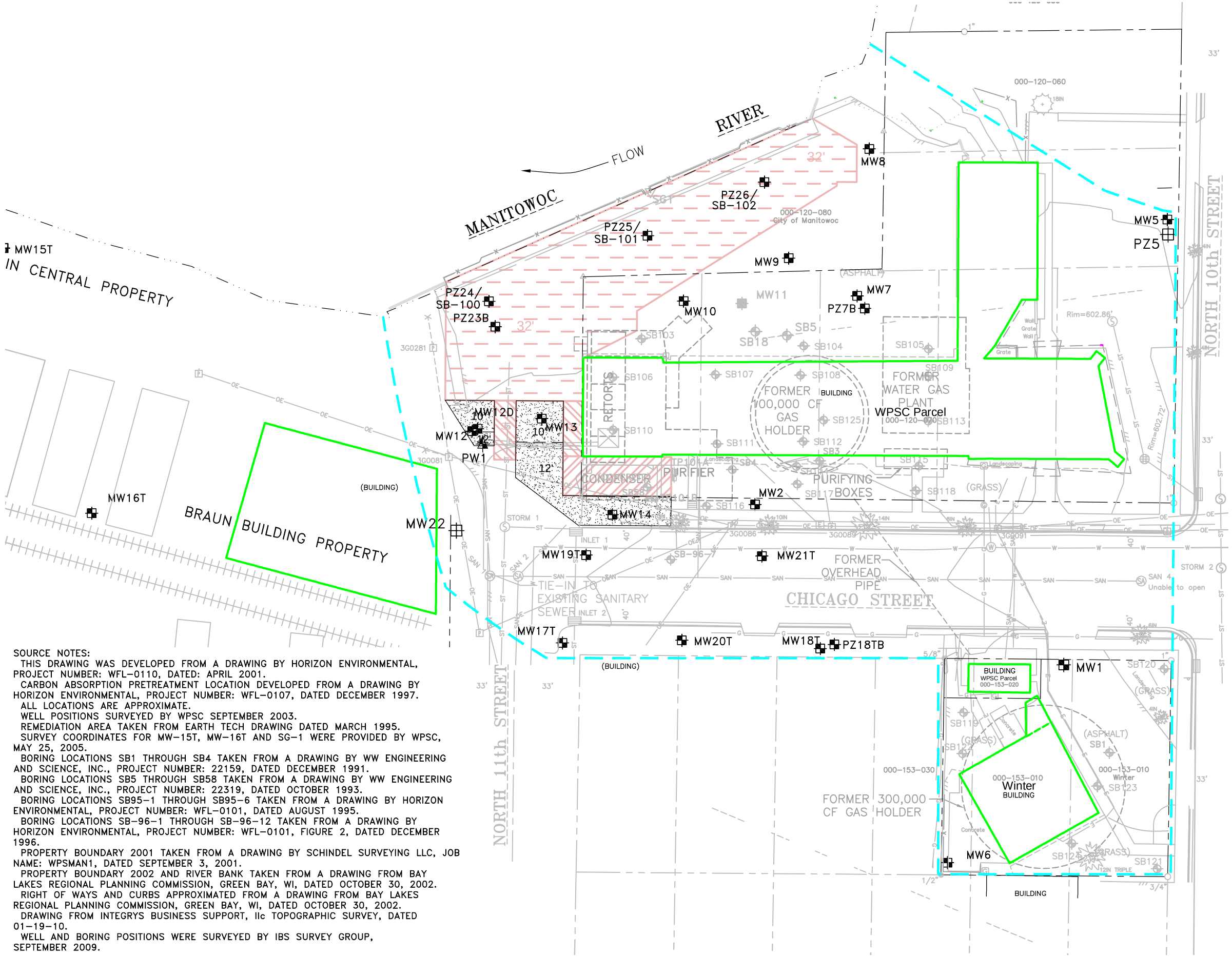

LEGEND

PZ5	PROPOSED WELL/PIEZOMETER
MW7	MONITORING WELL
PZ24	PIEZOMETER
PZ23B	BEDROCK PIEZOMETER
MW11	ABANDONED MONITORING WELL
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CHECKED BY:	CJM	DATE: 04/24/12
APPROVED BY:	JAZ	DATE: 04/24/12
DRAWING NO: 1530-153-B06C		
REFERENCE:		

PROPOSED WELL/PIEZOMETER LOCATIONS

TECHNICAL MEMORANDUM (REV. 2) - SUPPLEMENTAL RI
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1530/15.3

FIGURE NO.
6

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IMAGES:
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TABLES

Table 1. Soil Analytical Results - PVOCs, Metals and Cyanide
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample Location	Sample Depth (FT)	Sample Date	Benzene (ug/kg)	Ethylbenzene (ug/kg)	Toluene (ug/kg)	Xylene, o (ug/kg)	Xylenes, m + p (ug/kg)	Xylenes, Total (ug/kg)	1,2,4-trimethylbenzene (ug/kg)	1,3,5-Trimethylbenzene (ug/kg)	Methyl-tert-butyl-ether (ug/kg)	Cyanide, Total (ug/kg)	Lead, Total (ug/kg)	Vanadium, Total (ug/kg)
Industrial Soil Screening Levels			5400	27000	4.50E+07	1.90E+07	1.70E+07	2700000	260000	1.00E+07	220000	2.00E+07	800000	5.20E+06
MW15T	5-6	05/15/95	< 5	< 5	< 5	--	--	< 15	< 5	< 5	< 5	3200	--	--
MW16T	3-4	05/16/95	< 5	< 5	< 5	--	--	< 15	< 5	< 5	< 5	< 300	--	--
MW17T	10-11	05/17/95	< 5	< 5	< 5	--	--	< 15	< 5	< 5	< 5	< 300	--	--
MW18T	13-14.5	05/17/95	< 5	< 5	< 5	--	--	< 15	< 5	< 5	< 5	< 300	--	--
SB01	7-7.5	08/25/88	**9000**	8600	7900	--	--	--	--	--	--	< 40000	490000	--
SB02	20-21.5	08/25/88	< 25	< 25	< 25	--	--	--	--	--	--	< 10000	< 1000	--
SB03	16-17	08/25/88	**32000**	22000	65000	--	--	--	--	--	--	< 10000	41000	--
SB04	7.5-9	08/25/88	< 25	26	< 25	--	--	--	--	--	--	10000	10000	--
SB05	15-16.5	08/25/88	< 25	< 25	< 25	--	--	--	--	--	--	< 10000	< 1000	--
SB101	26-28	09/15/09	**44900**	**47900**	57600	54000	94300	--	66300	28200	< 10000	18900	97300	17400
	34-36	09/15/09	82.3	< 25	51.8	31.4	< 50	--	< 25	< 25	< 25	280	1400	12000
SB103	4-6	09/14/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	3000	16700	33400
	10-12	09/14/09	4170	11000	8400	5270	10000	--	6540	1930	< 62.5	< 750	3600	36600
	16-18	09/14/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	< 78	< 1200	12500
SB104	4-6	09/14/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	630	20800	20300
	10-12	09/14/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	< 550	1100	17300
	18-20	09/14/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	690	< 1200	11700
SB105	6-8	09/14/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	420	1200	17800
SB106	4-8	09/15/09	217	1280	365	1740	1870	--	2020	1220	< 62.5	6900	34100	23100
SB107	4-6	09/14/09	158	99	339	119	206	--	86	36.3	< 25	1100	6600	15100
SB108	0-2	09/15/09	170	238	456	1010	540	--	755	334	< 50	1000	8600	16800
	4-6	09/15/09	420	103	432	1220	431	--	793	242	< 62.5	1000	12100	18700
SB109	8-10	09/15/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	< 520	1100	16800
SB110	0-2	09/15/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	< 75	1200	14100
	4-6.5	09/15/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	< 640	1200	13500
SB111	0-2	09/15/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	1200	6200	21400
	6-8	09/15/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	1200	1000	15400
	12-14	09/15/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	1700	< 1200	12300
	16-18	09/15/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	< 750	1100	16200
SB112	4-6	09/15/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	< 470	1200	16200
	8-10	09/15/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	< 630	< 1200	11900
	12-14	09/15/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	< 94	< 1200	12900
SB113	0-2	09/15/09	< 25	< 25	43.1	33.1	< 50	--	< 25	< 25	< 25	1200	21200	18100
	2-4	09/15/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	410	2700	23800
	8-10	09/15/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	480	1400	19800
SB114	0-2	09/14/09	53.3	35.7	83.9	178	69.8	--	74.3	< 25	< 25	< 500	38500	21600
	8-10	09/14/09	44.5	< 25	62.4	73.6	< 50	--	< 25	< 25	< 25	< 560	14400	15600
	12-14	09/14/09	< 25	< 25	< 25	29.9	< 50	--	< 25	< 25	< 25	450	9000	25300
	16-17	09/14/09	**144000**	**88400**	241000	324000	172000	--	122000	31900	< 10000	13200	131000	13900

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Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample Location	Sample Depth (FT)	Sample Date	Benzene (ug/kg)	Ethylbenzene (ug/kg)	Toluene (ug/kg)	Xylene, o (ug/kg)	Xylenes, m + p (ug/kg)	Xylenes, Total (ug/kg)	1,2,4-trimethylbenzene (ug/kg)	1,3,5-Trimethylbenzene (ug/kg)	Methyl-tert-butyl-ether (ug/kg)	Cyanide, Total (ug/kg)	Lead, Total (ug/kg)	Vanadium, Total (ug/kg)
Industrial Soil Screening Levels			5400	27000	4.50E+07	1.90E+07	1.70E+07	2700000	260000	1.00E+07	220000	2.00E+07	800000	5.20E+06
SB115	0-2	09/14/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	< 800	31900	25100
	10-12	09/14/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	< 740	1600	18200
	18-20	09/14/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	< 450	1100	14600
SB116	0-2	09/14/09	38.5	35.4	166	106	153	--	81.1	49.1	< 25	10700	117000	26000
	14-16	09/14/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	1800	1200	18100
	20-22	09/14/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	870	1300	12900
	26-28	09/14/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	< 590	1400	15000
SB117	0-2	09/14/09	< 25	< 25	51.6	33.6	< 50	--	< 25	< 25	< 25	1100	42700	21200
	12-14	09/14/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	< 560	1300	17800
	20-22	09/14/09	< 25	30.4	< 25	148	< 50	--	84.3	31.1	< 25	800	1300	13500
	30-32	09/14/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	< 470	1400	15500
SB118	0-2	09/14/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	1800	60700	21500
	6-8	09/14/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	1300	1500	17700
	18-20	09/14/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	< 580	1300	20000
SB119	0-2	09/14/09	41.5	54.5	167	235	146	--	101	31.1	< 27.5	< 770	109000	22800
	8-10	09/14/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	< 610	1800	15600
	18-20	09/14/09	< 25	< 25	< 25	< 25	< 50	--	28.7	< 25	< 25	160	1300	18300
SB120	0-2	09/14/09	< 25	37.2	133	175	112	--	78.9	27.3	< 25	< 640	73900	30500
	10-14	09/14/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	1400	2100	18000
	24-28	09/14/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	2800	2100	21100
SB121	0-2	09/14/09	< 25	32.3	63.7	134	76.5	--	47.1	< 25	< 25	< 830	40200	34600
	8-10	09/14/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	6800	2300	14700
	20-24	09/14/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	4000	2300	7700
SB122	0-2	09/14/09	44.9	293	234	1810	706	--	1190	391	< 25	< 810	56400	35200
	2-6	09/14/09	< 1250	< 1250	< 1250	< 1250	< 2500	--	< 1250	< 1250	< 1250	140	101000	28700
	12-14	09/14/09	< 133000	< 133000	< 133000	7150000	< 267000	--	**5570000**	< 133000	< 133000	1790000	**2240000**	25200
	28-30	09/14/09	< 25	36.6	44.9	230	86	--	170	69.4	< 25	5000	1400	11300
	38-40	09/14/09	< 25	< 25	< 25	79	< 50	--	49.1	< 25	< 25	2600	1800	17000
	42-44	09/14/09	< 25	< 25	29.2	72	< 50	--	39.5	< 25	< 25	5400	1800	16700
SB123	0-2	09/15/09	43.5	31.9	79.1	134	143	--	146	51.9	< 25	< 680	59300	27600
	6-7.5	09/15/09	**82800**	**55200**	201000	144000	311000	--	231000	86700	< 25000	3400	224000	32800
SB124	0-2	09/15/09	59.3	70.7	315	349	218	--	197	72.8	< 25	< 7200	81600	29300
	2-4	09/15/09	126	157	334	551	474	--	348	146	< 25	9700	121000	25900
	6-7.8	09/15/09	147	44.9	134	103	121	--	69.1	< 25	< 25	2000	291000	25200
SB125	0-2	09/15/09	42.1	< 25	49.1	36.4	< 50	--	< 25	< 25	< 25	2600	14000	18500
	6-8	09/15/09	64	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	730	1400	15700
	10-12	09/15/09	42.6	< 25	< 25	< 25	< 50	--	32	< 25	< 25	340	1100	12200
	18-20	09/15/09	53.8	< 25	32.9	< 25	< 50	--	< 25	< 25	< 25	210	< 1200	15100
SB16	5.5-7.5	11/06/91	< 10	< 10	< 10	--	--	< 10	--	--	--	< 500	< 2000	--
	22-24	11/06/91	< 10	< 10	< 10	--	--	< 10	--	--	--	< 500	< 2000	--

Table 1. Soil Analytical Results - PVOCs, Metals and Cyanide
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample Location	Sample Depth (FT)	Sample Date	Benzene (ug/kg)	Ethylbenzene (ug/kg)	Toluene (ug/kg)	Xylene, o (ug/kg)	Xylenes, m + p (ug/kg)	Xylenes, Total (ug/kg)	1,2,4-trimethylbenzene (ug/kg)	1,3,5-Trimethylbenzene (ug/kg)	Methyl-tert-butyl-ether (ug/kg)	Cyanide, Total (ug/kg)	Lead, Total (ug/kg)	Vanadium, Total (ug/kg)
Industrial Soil Screening Levels			5400	27000	4.50E+07	1.90E+07	1.70E+07	2700000	260000	1.00E+07	220000	2.00E+07	800000	5.20E+06
SB18	5.5-7.5	11/06/91	< 10	< 10	< 10	--	--	< 10	--	--	--	< 600	< 2000	--
	22-24	11/07/91	< 10	< 10	< 10	--	--	< 10	--	--	--	< 500	< 2000	--
SB20	4-6	10/28/91	< 10	57	58	--	--	< 10	--	--	--	< 500	1100	--
SB36	5.5-7.5	11/08/91	< 10	< 10	< 10	--	--	< 10	--	--	--	< 500	3400	--
	22-24	11/08/91	34	130	51	--	--	320	--	--	--	640	3000	--
SB45	18-20	04/14/93	< 10	< 10	< 10	--	--	< 30	--	--	--	< 110	< 1000	--
SB47	22-24	04/14/93	< 20	< 20	< 20	--	--	< 60	--	--	--	< 140	< 1000	--
SB50	22-24	04/13/93	16	76	21	--	--	85	--	--	--	320	< 1000	--
SB51	13-15	04/13/93	51	17	17	--	--	47	--	--	--	4100	2400	--
	18-20	04/13/93	< 10	32	25	--	--	58	--	--	--	3900	< 1000	--
SB52	13-15	04/13/93	< 10	< 10	< 10	--	--	< 30	--	--	--	< 150	< 1000	--
	22-24	04/13/93	< 10	< 10	< 10	--	--	< 30	--	--	--	220	< 1000	--
SB54	18-20	08/31/93	< 10	28	13	--	--	48	--	--	--	170	< 1000	--
SB57	18-20	09/01/93	430	< 100	1600	--	--	1000	--	--	--	350	< 1000	--
SB58	13-15	09/01/93	< 50	80	70	--	--	1000	--	--	--	5100	< 1000	--
SB95-1	4-6	05/15/95	< 5	< 5	< 5	--	--	< 15	< 5	< 5	< 5	1400	--	--
SB95-2	3-4.8	05/16/95	< 5	< 5	< 5	--	--	< 15	< 5	< 5	< 5	< 300	--	--
SB95-3	3-5	05/18/95	< 5	< 5	< 5	--	--	< 15	< 5	< 5	< 5	< 300	--	--
SB95-4	5.5-6	05/18/95	< 5	< 5	< 5	--	--	< 15	< 5	< 5	< 5	< 300	--	--
SB95-5	7-8.5	05/16/95	< 5	< 5	< 5	--	--	< 15	< 5	< 5	< 5	< 300	--	--
SB95-6	25-27	05/18/95	< 5	< 5	< 5	--	--	< 15	< 5	< 5	< 5	< 300	--	--
SB96-1	18-20	06/03/96	370	540	2700	--	--	5300	750	290	< 25	< 200	--	--
SB96-2	18-20	06/03/96	65	150	170	--	--	310	110	25	< 25	< 200	--	--
SB96-3	25-27	06/04/96	460	1800	770	--	--	1200	380	150	< 25	< 200	--	--
SB96-4	28-30	06/04/96	**14000**	**560000**	250000	--	--	510000	250000	74000	< 500	< 200	--	--
SB96-5	25-27	06/05/96	240	160	640	--	--	720	120	64	< 25	< 200	--	--
SB96-6	17-19	06/05/96	100	11000	1100	--	--	530000	210000	73000	< 25	< 200	--	--
	31-33	06/05/96	1900	**180000**	67000	--	--	250000	170000	54000	< 500	200	--	--
SB96-7	15-17	06/06/96	1800	**38000**	80000	--	--	800000	**320000**	150000	< 1300	< 200	--	--
	39-41	06/06/96	1100	8600	12000	--	--	81000	25000	7700	< 130	< 200	--	--
SB96-8	33-35	06/06/96	**10000**	**73000**	57000	--	--	250000	100000	29000	700	< 200	--	--
SB96-9	39-41	06/08/96	< 25	< 25	49	--	--	< 75	< 25	< 25	< 25	< 200	--	--
SB96-10	33-35	06/08/96	69	140	110	--	--	150	< 25	< 25	< 25	300	--	--
SB96-11	13-15	06/09/96	< 25	370	60	--	--	1100	1700	2600	< 25	600	--	--
SB96-12	25-27	06/09/96	470	580	2600	--	--	8100	2400	390	< 25	600	--	--
TP101A	17	09/22/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	600	1500	16300
TP101B	13.5	09/22/09	< 25	< 25	< 25	< 25	< 50	--	< 25	< 25	< 25	140	2000	11800

NOTES:

< 2.0: Parameter not detected above the limit of detection indicated.
--: Analysis not performed.
Concentrations exceeding the screening level are **BOLD.**

Table 2. Soil Analytical Results - Polynuclear Aromatic Hydrocarbons (PAHs)
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample Location	Sample Depth (FT)	Sample Date	1-Methylnaphthalene (ug/kg)	2-Methylnaphthalene (ug/kg)	Acenaphthene (ug/kg)	Acenaphthylene (ug/kg)	Anthracene (ug/kg)	Benzo(a)anthracene (ug/kg)	Benzo(a)pyrene (ug/kg)	Benzo(b)fluoranthene (ug/kg)	Benzo(ghi)perylene (ug/kg)	Benzo(k)fluoranthene (ug/kg)	Chrysene (ug/kg)	Dibenz(a,h)anthracene (ug/kg)	Fluoranthene (ug/kg)	Fluorene (ug/kg)	Indeno(1,2,3-cd)pyrene (ug/kg)	Naphthalene (PAH) (ug/kg)	Phenanthrene (ug/kg)	Pyrene (ug/kg)
Industrial Soil Screening Levels			99000	4.10E+06	3.30E+07	3.30E+07	1.70E+08	2100	210	2100	1.70E+07	21000	210000	210	2.20E+07	2.20E+07	2100	18000	1.70E+08	1.70E+07
MW15T	5-6	05/15/95	--	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330
MW16T	3-4	05/16/95	--	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330
MW17T	10-11	05/17/95	--	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330
MW18T	13-14.5	05/17/95	--	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330
SB01	7-7.5	08/25/88	--	--	< 10000	< 5000	< 5000	< 25000	< 25000	< 25000	< 50000	< 25000	< 25000	< 50000	11000	< 10000	< 50000	**1700000**	12000	9400
SB02	20-21.5	08/25/88	--	--	< 200	< 100	< 100	< 500	< 500	< 500	< 1000	< 500	< 500	< 1000	< 100	< 200	< 1000	< 100	170	< 100
SB03	16-17	08/25/88	--	--	52000	280000	220000	**82000**	**110000**	< 25000	90000	**150000**	120000	< 50000	370000	250000	**65000**	**730000**	630000	440000
SB04	7.5-9	08/25/88	--	--	< 200	< 100	< 100	< 500	**640**	< 500	< 1000	1200	< 500	< 1000	1100	< 200	< 1000	500	300	1100
SB05	15-16.5	08/25/88	--	--	< 200	< 100	< 100	< 500	< 500	< 500	< 1000	< 500	< 500	< 1000	< 100	< 200	< 1000	< 100	< 100	< 100
SB101	26-28	09/15/09	**315000**	604000	151000	572000	559000	**299000**	**257000**	**194000**	130000	**197000**	**275000**	**33400**	903000	439000	**113000**	**3280000**	1440000	729000
	34-36	09/15/09	86.8	151	68.6	81.1	95.2	40.9	38.1	31.8	27.1	32.4	42	< 5.8	131	87.7	21.1	1020	265	106
SB103	4-6	09/14/09	55.9	54.4	18.4	15.7	28.6	34.5	35.4	32.1	30.1	35.7	36.2	7.5	81.7	11.9	25.2	210	68.5	75.4
	10-12	09/14/09	58900	79900	39600	10100	26200	**12200**	**8920**	**3900**	3900	5620	11400	< 2630	23800	27900	**2680**	**179000**	74200	30200
	16-18	09/14/09	47.5	48.7	46.6	19.7	31.9	12.4	7.1	< 6.9	< 5.2	< 7.6	10	< 5.7	26.3	38.9	< 5.1	75.5	83.4	35
SB104	4-6	09/14/09	75.5	98.9	43.1	436	458	952	**1090**	878	762	838	907	207	1850	65	629	260	849	1780
	10-12	09/14/09	49.9	< 2.2	33.1	48	< 5.4	< 9.9	< 4.3	< 6.7	< 5	< 7.3	< 4.1	< 5.5	5.3	24.4	< 5	13.6	56.8	5.7
	18-20	09/14/09	2.6	< 2.2	10.5	8	7.4	< 10	< 4.4	< 6.8	< 5.1	< 7.5	< 4.1	< 5.6	< 1.3	8.3	< 5	16.4	5.5	< 1.2
SB105	6-8	09/14/09	< 2.2	< 2.2	< 1.1	< 2	< 5.4	< 9.8	< 4.3	< 6.7	< 4.9	< 7.3	< 4	< 5.5	< 1.3	< 1.1	< 4.9	1.7	< 2.3	< 1.2
SB106	4-8	09/15/09	35900	27300	51100	81600	92300	**124000**	**91200**	**60900**	48200	**69600**	127000	**14100**	253000	49700	**37600**	**34700**	154000	349000
SB107	4-6	09/14/09	41.4	53.7	< 9.8	303	191	246	**427**	373	551	192	451	105	430	58.7	404	415	406	500
SB108	0-2	09/15/09	12100	17200	1900	12200	9740	**5560**	**4770**	**2380**	2480	3090	5340	**518**	11600	9740	1720	**27500**	30000	15000
	4-6	09/15/09	38900	56900	4470	37400	26200	**13000**	**11200**	**5590**	5820	7000	12300	**1290**	29400	26400	**4080**	**100000**	81700	36900
SB109	8-10	09/15/09	< 2.2	< 2.2	< 1.1	< 2	< 5.3	< 9.8	< 4.2	< 6.6	< 4.9	< 7.3	< 4	< 5.5	< 1.3	< 1.1	< 4.9	21.1	< 2.3	1.4
SB110	0-2	09/15/09	4.6	4.2	7.5	15.9	23.5	20.2	16.5	8.6	9.8	12.6	19.2	< 4.8	34.8	9.7	7.3	19.3	47.4	49.3
	4-6.5	09/15/09	< 2	< 2	< 0.99	3.3	< 4.9	< 8.9	5.7	< 6	< 4.5	< 6.6	5.9	< 5	8.7	< 0.97	< 4.5	15.3	4.3	12
SB111	0-2	09/15/09	31.9	75.2	37.7	1080	518	919	**1860**	1340	1550	875	976	**368**	1000	31.5	1190	192	290	1390
	6-8	09/15/09	2.3	< 2	< 1	< 1.9	< 5	< 9.2	< 4	< 6.2	< 4.6	< 6.8	< 3.8	< 5.1	1.7	< 1	< 4.6	27.5	< 2.2	2.7
	12-14	09/15/09	118	< 4.5	21.5	30.1	< 11	< 20.1	< 8.7	< 13.7	< 10.2	< 15	< 8.3	< 11.2	< 2.7	951	< 10.1	45.9	120	< 2.5
	16-18	09/15/09	51.9	< 2.2	19.9	34.8	< 5.5	< 10	< 4.3	< 6.8	< 5	< 7.4	< 4.1	< 5.6	< 1.3	4.9	< 5	15.4	2.6	< 1.2
SB112	4-6	09/15/09	< 2.2	< 2.2	< 1.1	3.1	< 5.4	< 9.8	< 4.3	< 6.7	< 4.9	< 7.3	< 4	< 5.5	< 1.3	< 1.1	< 4.9	11.6	2.5	< 1.2
	8-10	09/15/09	61.2	6.2	4.4	7.3	7.7	< 9.6	< 4.2	< 6.5	< 4.8	< 7.1	< 4	< 5.4	< 1.3	33.3	< 4.8	169	44.2	< 1.2
	12-14	09/15/09	52.1	2.4	4.2	9.7	< 5.4	< 9.8	< 4.3	< 6.7	< 4.9	< 7.3	< 4	< 5.5	< 1.3	53.2	< 4.9	19.4	99.2	< 1.2
SB113	0-2	09/15/09	195	394	217	1790	6730	**11300**	**9470**	**9300**	6440	9180	10900	**1740**	29700	505	**5760**	1970	17600	23900
	2-4	09/15/09	3.7	7.6	< 1.1	13.6	8.9	19	17.3	10	11.5	12.2	19.2	< 5.6	28.8	2.7	7.9	96.4	22.9	42.1
	8-10	09/15/09	< 2.2	2.2	< 1.1	< 2	< 5.4	< 9.9	< 4.3	< 6.7	< 5	< 7.3	< 4.1	< 5.5	< 1.3	< 1.1	< 5	31	< 2.4	< 1.2
SB114	0-2	09/14/09	505	850	41.8	337	46.6	80.7	89.8	78.3	80.1	82	89.3	< 38.7	117	99.9	59.1	2870	112	127
	8-10	09/14/09	121	292	97.6	1960	914	1760	**3010**	1860	2410	1780	1940	**459**	2340	55.1	1560	953	596	3690
	12-14	09/14/09	42.7	56.9	5.9	27.8	10.1	11	9.8	< 6.7	6.5	< 7.3	10.3	< 5.5	16.8	11.6	< 4.9	522	26.6	22.9
	16-17	09/14/09	**1210000**	1790000	178000	1220000	834000	**444000**	**474000**	**243000**	293000	**300000**	**449000**	**51300**	1090000	743000	**193000**	**4470000**	2590000	1290000
SB115	0-2	09/14/09	16.4	23.5	3.2	46.3	32.5	94.2	115	110	95.1	99.1	102	22.9	175	4.2	76.9	49.2	58.5	165
	10-12	09/14/09	< 2	< 2.1	< 1	< 1.9	< 5.1	< 9.3	< 4	< 6.3	< 4.7	< 6.9	< 3.8	< 5.2	< 1.2	< 1	< 4.7	24.8	< 2.2	< 1.1
	18-20	09/14/09	< 2.1	< 2.1	< 1.1	< 2	< 5.3	< 9.6	< 4.2	< 6.5	< 4.9	< 7.2	< 4	< 5.4	< 1.3	< 1.1	< 4.9	41.9	< 2.3	< 1.2
SB116	0-2	09/14/09	313	561	119	1450	1630	**4790**	**5370**	**4980**	4000	4440	4580	**1010**	10900	219	**3300**	1540	3420	10600
	14-16	09/14/09	2.7	3.8	< 1.1	< 1.9	< 5.2	< 9.6	< 4.1	< 6.5	< 4.8	< 7.1	< 3.9	< 5.3	1.8	1	< 4.8	22.7	3	2
	20-22	09/14/09	49.2	5.4	22.3	28.3	60.8	105	104	86.6	61.8	83	102	14.9	305	15.9	51.5	48.7	141	277
	26-28	09/14/09	143	8.1	30.8	143	< 5.4	< 9.8	< 4.3	< 6.7	< 5	< 7.3	< 4	< 5.5	3.7	37.9	< 4.9	58.2	3.3	3.8
SB117	0-2	09/14/09	30.5	63.5	16.9	241	149	368	**467**	473	487	406	385	115	733	16.4	369	674	225	717
	12-14	09/14/09	4.6	14.3	19	119	54.6	89.9	181	114	96.2	102	74.5	24	99.8	14.5	72.6	210	51.1	150
	20-22	09/14/09	445	51.2	2400	1440	4990	**3360**	**3240**	1660	1440	2190	2960	**345**	9490	3000	1110	957	13700	11300
	30-32	09/14/09	3.5	3.1	35.8	14.4	5.9	< 10.1	< 4.4	< 6.8	< 5.1	< 7.5	< 4.1	< 5.6	8.2	21.1	< 5.1	148	65.7	10.7

Natural Resource Technology

Table 2. Soil Analytical Results - Polynuclear Aromatic Hydrocarbons (PAHs)
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample Location	Sample Depth (FT)	Sample Date	1-Methylnaphthalene (ug/kg)	2-Methylnaphthalene (ug/kg)	Acenaphthene (ug/kg)	Acenaphthylene (ug/kg)	Anthracene (ug/kg)	Benzo(a)anthracene (ug/kg)	Benzo(a)pyrene (ug/kg)	Benzo(b)fluoranthene (ug/kg)	Benzo(ghi)perylene (ug/kg)	Benzo(k)fluoranthene (ug/kg)	Chrysene (ug/kg)	Dibenz(a,h)anthracene (ug/kg)	Fluoranthene (ug/kg)	Fluorene (ug/kg)	Indeno(1,2,3-cd)pyrene (ug/kg)	Naphthalene (PAH) (ug/kg)	Phenanthrene (ug/kg)	Pyrene (ug/kg)
Industrial Soil Screening Levels			99000	4.10E+06	3.30E+07	3.30E+07	1.70E+08	2100	210	2100	1.70E+07	21000	210000	210	2.20E+07	2.20E+07	2100	18000	1.70E+08	1.70E+07
SB118	0-2	09/14/09	37.2	82.6	19.1	533	230	288	**538**	499	583	355	324	135	515	25.2	426	270	227	514
	6-8	09/14/09	< 2	< 2	< 1	3.3	< 4.9	< 9	< 3.9	< 6.1	< 4.5	< 6.7	< 3.7	< 5	1.8	< 0.98	< 4.5	59.5	2.2	2.2
	18-20	09/14/09	< 2	< 2	< 0.99	< 1.8	< 4.9	< 8.9	< 3.9	< 6.1	< 4.5	< 6.6	< 3.7	< 5	< 1.2	< 0.98	< 4.5	31.3	< 2.1	1.1
SB119	0-2	09/14/09	101	159	139	< 70.2	384	783	**722**	490	439	662	778	< 192	1330	123	361	17800	941	1220
	8-10	09/14/09	4.4	8	< 0.98	2.4	< 4.9	< 8.9	< 3.9	< 6	< 4.5	< 6.6	< 3.7	< 5	< 1.2	< 0.97	< 4.5	290	< 2.1	< 1.1
	18-20	09/14/09	5.1	5.1	1.9	4.9	< 5.2	< 9.6	4.2	< 6.5	< 4.8	< 7.1	< 3.9	< 5.3	< 1.3	< 1	< 4.8	32.1	< 2.3	2.6
SB120	0-2	09/14/09	1030	1480	7330	627	18700	**18700**	**17000**	**13300**	9780	13500	18700	**3150**	52000	6500	**8020**	9660	60200	44200
	10-14	09/14/09	2.1	4.6	< 0.95	< 1.8	< 4.7	< 8.6	< 3.7	< 5.8	< 4.3	< 6.4	< 3.5	< 4.8	2.2	< 0.94	< 4.3	323	2.4	2.2
	24-28	09/14/09	< 2	< 2	< 1	< 1.8	< 4.9	< 9	< 3.9	< 6.1	< 4.5	< 6.7	< 3.7	< 5	< 1.2	< 0.98	< 4.5	72	< 2.1	< 1.1
SB121	0-2	09/14/09	108	163	66.9	61.6	255	854	**972**	1030	754	955	1130	204	2150	93.5	597	3930	1080	1690
	8-10	09/14/09	5.1	10.8	< 0.96	< 1.8	< 4.7	< 8.6	< 3.7	< 5.9	< 4.4	< 6.4	< 3.6	< 4.8	< 1.1	< 0.94	< 4.3	570	< 2.1	< 1
	20-24	09/14/09	< 2	< 2	< 1	< 1.8	< 4.9	< 9	< 3.9	< 6.1	< 4.5	< 6.7	< 3.7	< 5	< 1.2	< 0.98	< 4.5	749	< 2.1	< 1.1
SB122	0-2	09/14/09	581	1150	154	143	< 351	< 642	< 279	< 435	< 323	< 477	< 264	< 358	362	153	< 323	**26400**	579	428
	2-6	09/14/09	< 261	333	235	< 241	724	1670	**1410**	901	846	1370	1590	< 659	2530	256	638	**52200**	1660	2280
	12-14	09/14/09	< 81500000	< 82000000	< 40900000	< 75300000	< 202000000	< 369000000	< 160000000	< 250000000	< 186000000	< 274000000	< 152000000	< 206000000	< 48600000	< 40300000	< 186000000	**4830000000**	< 87800000	< 44900000
	28-30	09/14/09	< 200	< 201	< 100	< 184	< 495	< 904	< 393	< 613	< 456	< 671	< 372	< 504	< 119	< 98.8	< 455	**48200**	< 215	< 110
	38-40	09/14/09	48.3	90	< 20.1	< 37	< 99.2	< 181	< 78.7	< 123	< 91.3	< 135	< 74.6	< 101	< 23.9	< 19.8	< 91.2	9960	< 43.1	< 22
	42-44	09/14/09	55.1	98.8	< 12.6	< 23.2	< 62.3	< 114	< 49.4	< 77.2	< 57.4	< 84.5	< 46.9	< 63.5	< 15	13.2	< 57.3	4030	< 27.1	< 13.8
SB123	0-2	09/15/09	64.1	145	< 9.9	< 18.3	< 49.1	< 89.7	< 39	< 60.8	< 45.2	< 66.6	< 36.9	< 50	< 11.8	< 9.8	< 45.1	3300	< 21.3	11.1
	6-7.5	09/15/09	39000	81000	< 7690	< 14100	< 38000	< 69300	< 30100	< 47000	< 34900	< 51500	< 28500	< 38700	< 9130	< 7570	< 34900	**1860000**	< 16500	< 8430
SB124	0-2	09/15/09	143	308	< 20	< 36.7	< 98.5	< 180	90.9	< 122	96.3	< 134	109	< 100	175	< 19.7	< 90.5	6760	98	148
	2-4	09/15/09	110	230	< 19.8	826	140	439	**738**	664	980	529	413	**235**	373	< 19.5	782	2920	101	415
	6-7.8	09/15/09	4720	9960	222	417	< 1080	< 1970	< 855	< 1330	< 992	< 1460	< 810	< 1100	652	317	< 990	**120000**	968	589
SB125	0-2	09/15/09	23.4	56.8	13.4	289	128	195	**436**	327	320	216	217	81.1	219	6.8	241	422	68.6	315
	6-8	09/15/09	54.5	3.3	10.5	18.3	< 5.5	< 10	< 4.3	< 6.8	< 5	< 7.4	< 4.1	< 5.6	< 1.3	5.8	< 5	110	< 2.4	1.2
	10-12	09/15/09	70.1	6.9	2.7	4.5	< 5.3	< 9.7	< 4.2	< 6.6	< 4.9	< 7.2	< 4	< 5.4	< 1.3	29.1	< 4.9	230	34.3	< 1.2
	18-20	09/15/09	35.1	61.5	7	21.1	7	< 9.9	< 4.3	< 6.7	< 5	< 7.4	< 4.1	< 5.5	4.6	16.4	< 5	311	26.1	6
SB16	5.5-7.5	11/06/91	--	--	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 1000	< 500	< 500	< 500	< 500
	22-24	11/06/91	--	--	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 1000	< 500	< 500	< 500	< 500
SB18	5.5-7.5	11/06/91	--	--	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 1000	< 500	< 500	< 500	< 500
	22-24	11/07/91	--	--	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 1000	< 500	< 500	< 500	< 500
SB20	4-6	10/28/91	--	--	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 1000	< 500	< 500	< 500	< 500
SB36	5.5-7.5	11/08/91	--	--	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 1000	< 500	< 500	< 500	< 500
	22-24	11/08/91	--	--	< 500	< 500	< 500	< 500	< 500	**5000**	< 500	5000	< 500	< 500	1400	< 1000	< 500	3300	1700	1500
SB45	18-20	04/14/93	--	--	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330
SB47	22-24	04/14/93	--	--	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330
SB50	22-24	04/13/93	--	--	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	1300	< 330	< 330
SB51	13-15	04/13/93	--	--	< 330	< 330	4900	**3700**	< 330	**4800**	< 330	4800	4100	< 330	13000	3400	< 330	**23000**	19000	10000
	18-20	04/13/93	--	--	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	690	< 330	< 330	1500	860	520
SB52	13-15	04/13/93	--	--	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330
	22-24	04/13/93	--	--	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	390	< 330	< 330	< 330	460	< 330
SB54	18-20	08/31/93	--	430	< 330	< 330	< 330	< 330	--	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	--	< 330	< 330
SB57	18-20	09/01/93	--	680	< 330	330	< 330	< 330	--	< 330	< 330	< 330	< 330	< 330	< 330	370	< 330	--	< 330	< 330
SB58	13-15	09/01/93	--	970000	< 33000	310000	81000	**55000**	--	**65000**	< 33000	**65000**	53000	< 33000	160000	110000	< 33000	--	270000	140000
SB95-1	4-6	05/15/95	--	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330
SB95-2	3-4.8	05/16/95	--	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330
SB95-3	3-5	05/18/95	--	12000	5700	29000	58000	**52000**	**43000**	**36000**	14000	**40000**	47000	< 2000	152000	35000	**15000**	**19000**	193000	156000
SB95-4	5.5-6	05/18/95	--	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330

Table 2. Soil Analytical Results - Polynuclear Aromatic Hydrocarbons (PAHs)
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample Location	Sample Depth (FT)	Sample Date	1-Methylnaphthalene (ug/kg)	2-Methylnaphthalene (ug/kg)	Acenaphthene (ug/kg)	Acenaphthylene (ug/kg)	Anthracene (ug/kg)	Benzo(a)anthracene (ug/kg)	Benzo(a)pyrene (ug/kg)	Benzo(b)fluoranthene (ug/kg)	Benzo(ghi)perylene (ug/kg)	Benzo(k)fluoranthene (ug/kg)	Chrysene (ug/kg)	Dibenz(a,h)anthracene (ug/kg)	Fluoranthene (ug/kg)	Fluorene (ug/kg)	Indeno(1,2,3-cd)pyrene (ug/kg)	Naphthalene (PAH) (ug/kg)	Phenanthrene (ug/kg)	Pyrene (ug/kg)
Industrial Soil Screening Levels			99000	4.10E+06	3.30E+07	3.30E+07	1.70E+08	2100	210	2100	1.70E+07	21000	210000	210	2.20E+07	2.20E+07	2100	18000	1.70E+08	1.70E+07
SB95-5	7-8.5	05/16/95	--	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330
SB95-6	25-27	05/18/95	--	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330
SB96-1	18-20	06/03/96	--	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	1700	< 330	< 330
SB96-2	18-20	06/03/96	--	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	1200	< 330	< 330
SB96-3	25-27	06/04/96	--	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	1800	< 330	< 330
SB96-4	28-30	06/04/96	--	330000	< 83000	180000	< 83000	< 83000	< 83000	< 83000	< 83000	< 83000	< 83000	< 83000	130000	120000	< 83000	**1000000**	300000	140000
SB96-5	25-27	06/05/96	--	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	1000	470	< 330
SB96-6	17-19	06/05/96	--	< 83000	< 83000	< 83000	< 83000	< 83000	< 83000	< 83000	< 83000	< 83000	< 83000	< 83000	< 83000	< 83000	< 83000	**360000**	< 83000	< 83000
	31-33	06/05/96	--	170000	< 170000	< 170000	< 170000	< 170000	< 170000	< 170000	< 170000	< 170000	< 170000	< 170000	< 170000	< 170000	< 170000	**570000**	< 170000	< 170000
SB96-7	15-17	06/06/96	--	< 170000	< 170000	< 170000	< 170000	< 170000	< 170000	< 170000	< 170000	< 170000	< 170000	< 170000	< 170000	< 170000	< 170000	**1100000**	< 170000	< 170000
	39-41	06/06/96	--	41000	< 17000	< 17000	< 17000	< 17000	< 17000	< 17000	< 17000	< 17000	< 17000	< 17000	< 17000	< 17000	< 17000	**130000**	24000	< 17000
SB96-8	33-35	06/06/96	--	370000	< 170000	< 170000	< 170000	< 170000	< 170000	< 170000	< 170000	< 170000	< 170000	< 170000	< 170000	< 170000	< 170000	**1300000**	< 170000	< 170000
SB96-9	39-41	06/08/96	--	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330
SB96-10	33-35	06/08/96	--	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330
SB96-11	13-15	06/09/96	--	< 1600	< 1600	< 1600	< 1600	< 1600	< 1600	< 1600	< 1600	< 1600	< 1600	< 1600	< 1600	< 1600	< 1600	8700	< 1600	< 1600
SB96-12	25-27	06/09/96	--	1000	< 330	430	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	< 330	4600	< 330	< 330
TP101A	17	09/22/09	< 2.4	< 2.4	< 1.2	< 2.2	< 6	< 11	< 4.8	< 7.5	< 5.5	< 8.2	< 4.5	< 6.1	< 1.4	< 1.2	< 5.5	5.2	< 2.6	< 1.3
TP101B	13.5	09/22/09	< 1.9	1.9	< 0.97	12.8	5.7	17.1	25.4	17.8	21.5	19.2	16.6	5.6	23.4	< 0.95	14.9	2	5.1	25.8

NOTES:

< 2.0: Parameter not detected above the limit of detection indicated.
--: Analysis not performed.
Concentrations exceeding the screening level are **BOLD.**

Table 3. Groundwater Screening for Vapor Intrusion Evaluation - PVOCs, Metals and Cyanide
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample Location	Sample Date	1,2,4-Trimethylbenzene (ug/l)	1,3,5-Trimethylbenzene (ug/l)	Trimethylbenzenes, Total (ug/l)	Benzene (ug/l)	Ethylbenzene (ug/l)	Toluene (ug/l)	Xylene, o (ug/l)	Xylenes, m + p (ug/l)	Xylenes, Total (ug/l)	Methyl-tert-butyl-ether (ug/l)	Aluminum, Dissolved (ug/l)	Iron, Dissolved (ug/l)	Manganese, Dissolved (ug/l)	Vanadium, Dissolved (ug/l)	Cyanide, Amenable (mg/l)	Cyanide, Available (mg/l)	Cyanide, Total (mg/l)	Cyanide, Weak Acid Diss. (mg/l)
Industrial Vapor Intrusion Screening (CR 1X10-6)		123	NS	NS	7.05	700	81000	14600	11000	10000	1960	NS	NS	NS	NS	NS	NS	NS	NS
MW01	03/27/01	--	--	< 1	< 1	< 1	< 1	--	--	< 3	< 5	--	--	--	--	< 0.02	--	< 0.005	--
	06/05/02	--	--	< 0.92	< 0.45	< 0.82	< 0.68	--	--	< 0.77	< 0.43	--	--	--	--	0.019	--	0.021	< 0.0022
	11/19/03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/25/04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/24/04	--	--	< 0.4	< 0.14	< 0.4	< 0.36	--	--	< 0.74	< 0.36	--	--	--	--	--	< 0.005	--	--
	05/18/05	--	--	< 0.97	< 0.41	< 0.54	< 0.67	--	--	< 1.8	< 0.61	--	--	--	--	--	--	--	--
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	< 0.39	< 0.4	< 0.4	0.21	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	--	--	--	--	--	--	--	--
	05/16/07	3.1	0.64	3.74	4.7	1.3	7	2.8	4.4	7.2	< 0.36	--	--	--	--	--	--	--	--
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/27/09	< 0.39	< 0.4	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	< 6	< 250	10.2	0.54	--	< 0.0007	--	--
	04/27/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	< 0.61	14.4	148	6.7	0.52	--	< 0.0008	--	--
	07/27/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	--	--	< 4.5	207	--	--	--	--	--
	11/03/10	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--	< 0.61	--	64	6.4	--	--	--	--	--
	05/18/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--	< 0.38	--	22.4	7.1	--	--	--	--	--
	11/02/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3	< 0.38	--	50.7	3.2	--	--	--	--	--
MW02	04/11/00	--	--	< 1	4.6	5.5	3.3	--	--	< 3	< 50	--	--	--	--	< 0.005	--	0.18	--
	03/27/01	--	--	2.8	1.4	40	1.4	--	--	3.6	< 5	--	--	--	--	0.053	--	0.17	--
	06/05/02	--	--	1.6	0.63	18	0.85	--	--	1.6	< 0.43	--	--	--	--	0.041	--	0.043	0.01
	05/15/03	--	--	1.1	0.79	19	2.9	--	--	5.2	< 0.58	--	--	--	--	0.14	--	0.14	0.011
	02/25/04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/24/04	--	--	1.9	0.64	40	3.2	--	--	7.3	< 0.36	--	--	--	--	--	0.02	--	--
	05/18/05	--	--	4.4	< 0.41	38	0.94	--	--	2.6	< 0.61	--	--	--	--	--	--	--	--
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	5.3	< 0.4	5.3	1	7.8	< 0.36	2	1.3	2.3	< 0.36	--	--	--	--	--	--	--	--
	05/16/07	1.2	< 0.4	1.2	2.3	4.8	< 0.36	1.2	0.77	1.79	0.4	--	--	--	--	--	--	--	--
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/27/09	1.3	< 0.4	1.3	5.3	4.8	< 0.36	2	1.7	3.7	0.41	< 250	2080	112	< 0.41	--	< 0.0007	--	--
	01/27/10	0.82	< 0.4	0.82	4.3	3.4	0.45	1.2	1.2	2.4	< 0.38	< 250	840	85.2	< 0.41	--	< 0.0007	--	--
	04/27/10	< 0.97	< 0.83	< 0.97	1.1	0.55	< 0.67	< 0.83	< 1.8	< 1.8	< 0.61	4.5	219	35	0.4	--	< 0.0008	--	--
	07/26/10	< 0.97	< 0.83	< 0.97	4	2.4	< 0.67	1	< 1.8	< 1.8	--	--	1080	77.4	--	--	--	--	--
	11/03/10	2.2	< 0.83	--	6.2	4.4	0.84	2.8	3.2	--	< 0.61	--	1680	108	--	--	--	--	--
	05/18/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--	< 0.38	--	725	65.4	--	--	--	--	--
	11/02/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3	< 0.38	--	314	63.3	--	--	--	--	--
MW05	06/05/02	--	--	< 0.92	< 0.45	< 0.82	< 0.68	--	--	< 0.77	< 0.43	--	--	--	--	0.046	--	0.047	< 0.0022
	05/15/03	--	--	< 0.66	< 0.3	< 0.6	< 0.58	--	--	< 1.2	< 0.58	--	--	--	--	< 0.0015	--	0.0019	0.0022
	02/25/04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/24/04	--	--	< 0.4	< 0.14	< 0.4	< 0.36	--	--	< 0.74	< 0.36	--	--	--	--	--	< 0.005	--	--
	05/18/05	--	--	< 0.97	< 0.41	< 0.54	< 0.67	--	--	< 1.8	< 0.61	--	--	--	--	--	--	--	--
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	< 0.39	< 0.4	< 0.4	0.44	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	--	--	--	--	--	--	--	--
	05/16/07	< 0.39	< 0.4	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	--	--	--	--	--	--	--	--
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/27/09	< 0.39	< 0.4	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	< 6	< 250	13	0.51	--	< 0.0007	--	--
	01/27/10	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87	< 0.38	< 6	< 250	22.7	0.68	--	< 0.0007	--	--
	04/27/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	< 0.61	3.5	140	22.6	0.53	--	< 0.0008	--	--
	07/26/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	--	--	81.6	24.8	--	--	--	--	--
	11/03/10	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--	< 0.61	--	28.6	6.6	--	--	--	--	--
	05/18/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--	< 0.38	--	19.4	4.5	--	--	--	--	--
	11/02/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3	< 0.38	--	25.1	2.6	--	--	--	--	--

Table 3. Groundwater Screening for Vapor Intrusion Evaluation - PVOCs, Metals and Cyanide
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample Location	Sample Date	1,2,4-Trimethylbenzene (ug/l)	1,3,5-Trimethylbenzene (ug/l)	Trimethylbenzenes, Total (ug/l)	Benzene (ug/l)	Ethylbenzene (ug/l)	Toluene (ug/l)	Xylene, o (ug/l)	Xylenes, m + p (ug/l)	Xylenes, Total (ug/l)	Methyl-tert-butyl-ether (ug/l)	Aluminum, Dissolved (ug/l)	Iron, Dissolved (ug/l)	Manganese, Dissolved (ug/l)	Vanadium, Dissolved (ug/l)	Cyanide, Amenable (mg/l)	Cyanide, Available (mg/l)	Cyanide, Total (mg/l)	Cyanide, Weak Acid Diss. (mg/l)
Industrial Vapor Intrusion Screening (CR 1X10-6)		123	NS	NS	7.05	700	81000	14600	11000	10000	1960	NS	NS	NS	NS	NS	NS	NS	NS
MW06	04/11/00	--	--	< 1	< 1	< 1	< 1	--	--	< 3	< 50	--	--	--	--	< 0.005	--	0.066	--
	03/27/01	--	--	< 1	< 1	4.1	< 1	--	--	9.9	< 5	--	--	--	--	0.026	--	0.095	--
	10/25/01	--	--	< 1	< 1	< 1	< 1	--	--	< 3	< 5	--	--	--	--	--	--	--	--
	06/05/02	--	--	< 0.92	< 0.45	< 0.82	< 0.68	--	--	< 0.77	< 0.43	--	--	--	--	0.19	--	0.21	0.0099
	05/15/03	--	--	< 0.66	< 0.3	< 0.6	< 0.58	--	--	< 1.2	< 0.58	--	--	--	--	0.19	--	0.19	0.017
MW07	04/11/00	--	--	< 1	< 1	< 1	< 1	--	--	< 3	< 50	--	--	--	--	< 0.005	--	0.008	--
	03/27/01	--	--	< 1	< 1	< 1	< 1	--	--	< 3	< 5	--	--	--	--	< 0.02	--	0.18	--
	06/05/02	--	--	< 0.92	< 0.45	< 0.82	< 0.68	--	--	< 0.77	< 0.43	--	--	--	--	0.18	--	0.47	0.028
	05/15/03	--	--	< 0.66	< 0.3	< 0.6	< 0.58	--	--	< 1.2	< 0.58	--	--	--	--	0.35	--	0.35	0.032
	10/26/09	< 0.39	< 0.4	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	< 250	< 250	30.7	1.1	--	< 0.0007	--	--
	01/27/10	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87	< 0.38	250	< 250	1.8	< 0.41	--	< 0.0007	--	--
	04/27/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	< 0.61	5.4	45.6	0.94	0.47	--	< 0.0008	--	--
	07/26/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	--	--	36	12.3	--	--	--	--	--
	11/02/10	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--	< 0.61	--	39.4	46.8	--	--	--	--	--
	05/17/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--	< 0.38	--	54	64	--	--	--	--	--
	11/01/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3	< 0.38	--	27.9	24.5	--	--	--	--	--
MW08	04/11/00	--	--	< 1	< 1	< 1	< 1	--	--	< 3	< 50	--	--	--	--	0.041	--	0.47	--
	03/27/01	--	--	< 1	< 1	< 1	< 1	--	--	< 3	< 5	--	--	--	--	< 0.02	--	0.35	--
	06/05/02	--	--	< 0.92	< 0.45	< 0.82	< 0.68	--	--	< 0.77	< 0.43	--	--	--	--	0.48	--	1.8	0.073
	05/15/03	--	--	< 0.66	< 0.3	< 0.6	< 0.58	--	--	< 1.2	< 0.58	--	--	--	--	1.2	--	1.2	0.09
	05/24/04	--	--	< 0.4	< 0.14	< 0.4	< 0.36	--	--	< 0.74	< 0.36	--	--	--	--	--	0.011	--	--
	05/18/05	--	--	< 0.97	< 0.41	< 0.54	< 0.67	--	--	< 1.8	< 0.61	--	--	--	--	--	--	--	--
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	< 0.39	< 0.4	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	--	--	--	--	--	--	--	--
	05/16/07	< 0.39	< 0.4	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	--	--	--	--	--	--	--	--
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/26/09	< 0.39	< 0.4	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	< 250	< 250	202	2.2	--	< 0.0007	--	--
	01/27/10	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87	< 0.38	< 6	< 250	51.8	0.84	--	< 0.0007	--	--
	04/27/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	< 0.61	3.4	196	154	1.3	--	0.004	--	--
	07/26/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	--	--	360	136	--	--	--	--	--
	11/02/10	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--	< 0.61	--	202	98	--	--	--	--	--
	05/17/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--	< 0.38	--	201	17.6	--	--	--	--	--
	11/01/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3	< 0.38	--	169	13.8	--	--	--	--	--
MW09	04/11/00	--	--	< 1	3.1	< 1	< 1	--	--	< 3	< 50	--	--	--	--	0.059	--	0.42	--
	03/27/01	--	--	< 1	**8.8**	< 1	< 1	--	--	< 3	< 5	--	--	--	--	< 0.02	--	0.18	--
	06/05/02	--	--	< 0.92	0.94	< 0.82	< 0.68	--	--	< 0.77	< 0.43	--	--	--	--	0.34	--	0.33	0.029
	05/15/03	--	--	< 0.66	1.3	< 0.6	< 0.58	--	--	< 1.2	< 0.58	--	--	--	--	0.18	--	0.18	0.0091
	02/25/04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/24/04	--	--	< 0.4	0.3	< 0.4	< 0.36	--	--	< 0.74	< 0.36	--	--	--	--	--	0.018	--	--
	05/18/05	--	--	< 0.97	< 0.41	< 0.54	< 0.67	--	--	< 1.8	< 0.61	--	--	--	--	--	--	--	--
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	< 0.39	< 0.4	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	--	--	--	--	--	--	--	--
	05/16/07	0.65	< 0.4	0.65	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	--	--	--	--	--	--	--	--
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/26/09	0.58	< 0.4	0.58	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	< 250	4890	641	3.4	--	0.0015	--	--
	01/27/10	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87	< 0.38	< 6	2850	630	1.6	--	< 0.0007	--	--
	04/27/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	< 0.61	4.2	482	281	0.91	--	< 0.0008	--	--

Table 3. Groundwater Screening for Vapor Intrusion Evaluation - PVOCs, Metals and Cyanide
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample Location	Sample Date	1,2,4-Trimethylbenzene (ug/l)	1,3,5-Trimethylbenzene (ug/l)	Trimethylbenzenes, Total (ug/l)	Benzene (ug/l)	Ethylbenzene (ug/l)	Toluene (ug/l)	Xylene, o (ug/l)	Xylenes, m + p (ug/l)	Xylenes, Total (ug/l)	Methyl-tert-butyl-ether (ug/l)	Aluminum, Dissolved (ug/l)	Iron, Dissolved (ug/l)	Manganese, Dissolved (ug/l)	Vanadium, Dissolved (ug/l)	Cyanide, Amenable (mg/l)	Cyanide, Available (mg/l)	Cyanide, Total (mg/l)	Cyanide, Weak Acid Diss. (mg/l)
Industrial Vapor Intrusion Screening (CR 1X10-6)		123	NS	NS	7.05	700	81000	14600	11000	10000	1960	NS	NS	NS	NS	NS	NS	NS	NS
MW10	04/11/00	--	--	9	< 1	< 1	< 1	--	--	< 3	< 50	--	--	--	--	0.007	--	0.15	--
	03/27/01	--	--	< 1	< 1	< 1	< 1	--	--	< 3	< 5	--	--	--	--	< 0.02	--	0.11	--
	06/05/02	--	--	< 0.92	< 0.45	< 0.82	< 0.68	--	--	< 0.77	4.6	--	--	--	--	0.15	--	0.28	0.01
	05/15/03	--	--	13	< 0.3	< 0.6	< 0.58	--	--	< 1.2	3.2	--	--	--	--	0.3	--	0.3	0.014
	02/25/04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/24/04	--	--	3.8	< 0.14	< 0.4	< 0.36	--	--	< 0.74	3	--	--	--	--	--	0.015	--	--
	05/18/05	--	--	7.5	< 0.41	< 0.54	< 0.67	--	--	< 1.8	1.3	--	--	--	--	--	--	--	--
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	1.3	< 0.4	1.3	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	1.5	--	--	--	--	--	--	--	--
	05/16/07	17	< 0.4	17	< 0.14	< 0.4	< 0.36	0.49	< 0.74	0.49	0.84	--	--	--	--	--	--	--	--
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/26/09	10.8	< 0.4	10.8	< 0.23	< 0.4	< 0.36	0.48	< 0.74	0.48	0.73	< 250	7470	916	4.1	--	0.0025	--	--
	01/27/10	5	< 0.4	5	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87	< 0.38	< 6	4070	746	1.4	--	< 0.0007	--	--
	04/27/10	21	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	< 0.61	5.7	3720	787	1.3	--	< 0.0008	--	--
	07/26/10	22.9	< 0.83	22.9	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	--	--	3960	775	--	--	--	--	--
	11/02/10	14.1	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--	< 0.61	--	4120	770	--	--	--	--	--
	05/17/11	10	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--	< 0.38	--	3990	817	--	--	--	--	--
	11/01/11	9.6	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3	0.44	--	5330	771	--	--	--	--	--
MW11	04/11/00	--	--	< 1	< 1	< 1	< 1	--	--	< 3	< 50	--	--	--	--	0.019	--	0.11	--
	03/27/01	--	--	< 1	< 1	< 1	< 1	--	--	< 3	< 5	--	--	--	--	< 0.02	--	0.14	--
	06/05/02	--	--	< 0.92	< 0.45	< 0.82	< 0.68	--	--	< 0.77	< 0.43	--	--	--	--	0.14	--	0.15	0.026
	05/15/03	--	--	< 0.66	< 0.3	< 0.6	< 0.58	--	--	< 1.2	< 0.58	--	--	--	--	0.14	--	0.14	0.016
	02/25/04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/24/04	--	--	< 0.4	< 0.14	< 0.4	< 0.36	--	--	< 0.74	< 0.36	--	--	--	--	--	< 0.005	--	--
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW12	04/11/00	--	--	< 1	< 1	< 1	< 1	--	--	< 3	< 50	--	--	--	--	0.017	--	0.8	--
	03/27/01	--	--	< 1	< 1	< 1	< 1	--	--	< 3	< 5	--	--	--	--	0.31	--	1.4	--
	06/05/02	--	--	< 0.92	< 0.45	< 0.82	< 0.68	--	--	< 0.77	< 0.43	--	--	--	--	0.63	--	0.73	0.016
	05/24/04	--	--	< 0.4	< 0.14	< 0.4	< 0.36	--	--	< 0.74	< 0.36	--	--	--	--	--	0.015	--	--
	05/18/05	--	--	< 0.97	< 0.41	< 0.54	< 0.67	--	--	< 1.8	< 0.61	--	--	--	--	--	--	--	--
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	06/20/06	< 0.39	< 0.4	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	--	--	--	--	--	--	--	--
	05/16/07	< 0.39	< 0.4	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	--	--	--	--	--	--	--	--
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/27/09	< 0.39	< 0.4	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	< 6	531	0.73	0.95	--	0.012	--	--
	01/26/10	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87	< 0.38	< 250	489	7.7	< 0.41	--	< 0.0007	--	--
	04/27/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	< 0.61	3.6	470	3.4	0.64	--	< 0.0008	--	--
	07/27/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	--	--	97.7	1800	--	--	--	--	--
	11/03/10	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--	< 0.61	--	93.2	1.4	--	--	--	--	--
	05/17/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--	< 0.38	--	377	2.4	--	--	--	--	--
	11/01/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3	< 0.38	--	63.2	< 0.32	--	--	--	--	--

Table 3. Groundwater Screening for Vapor Intrusion Evaluation - PVOCs, Metals and Cyanide
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample Location	Sample Date	1,2,4-Trimethylbenzene (ug/l)	1,3,5-Trimethylbenzene (ug/l)	Trimethylbenzenes, Total (ug/l)	Benzene (ug/l)	Ethylbenzene (ug/l)	Toluene (ug/l)	Xylene, o (ug/l)	Xylenes, m + p (ug/l)	Xylenes, Total (ug/l)	Methyl-tert-butyl-ether (ug/l)	Aluminum, Dissolved (ug/l)	Iron, Dissolved (ug/l)	Manganese, Dissolved (ug/l)	Vanadium, Dissolved (ug/l)	Cyanide, Amenable (mg/l)	Cyanide, Available (mg/l)	Cyanide, Total (mg/l)	Cyanide, Weak Acid Diss. (mg/l)
Industrial Vapor Intrusion Screening (CR 1X10-6)		123	NS	NS	7.05	700	81000	14600	11000	10000	1960	NS	NS	NS	NS	NS	NS	NS	NS
MW12D	04/11/00	--	--	< 1	< 1	< 1	< 1	--	--	< 3	< 50	--	--	--	--	< 0.005	--	0.039	--
	03/27/01	--	--	< 1	< 1	< 1	< 1	--	--	< 3	< 5	--	--	--	--	0.026	--	0.036	--
	06/05/02	--	--	< 0.92	< 0.45	< 0.82	< 0.68	--	--	< 0.77	< 0.43	--	--	--	--	0.097	--	0.11	< 0.011
	05/15/03	--	--	< 0.66	< 0.3	< 0.6	< 0.58	--	--	< 1.2	< 0.58	--	--	--	--	0.021	--	0.021	0.0041
	05/24/04	--	--	< 0.4	< 0.14	< 0.4	< 0.36	--	--	< 0.74	< 0.36	--	--	--	--	--	< 0.005	--	--
	05/18/05	--	--	< 0.97	2.3	< 0.54	< 0.67	--	--	< 1.8	< 0.61	--	--	--	--	--	--	--	--
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	< 0.39	< 0.4	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	--	--	--	--	--	--	--	--
	05/16/07	< 0.39	< 0.4	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	--	--	--	--	--	--	--	--
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/26/09	< 0.39	< 0.4	< 0.4	0.75	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	< 250	< 250	453	0.96	--	0.00091	--	--
	01/26/10	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87	< 0.38	< 6	< 250	342	< 0.41	--	< 0.0007	--	--
	04/27/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	< 0.61	2.5	71.1	357	0.59	--	< 0.0008	--	--
	07/27/10	< 0.97	< 0.83	< 0.97	3.3	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	--	--	33.1	3.3	--	--	--	--	--
	11/03/10	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--	< 0.61	--	41.9	611	--	--	--	--	--
	05/17/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--	< 0.38	--	41.9	373	--	--	--	--	--
	11/01/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3	< 0.38	--	30	328	--	--	--	--	--
MW13	04/11/00	--	--	720	**1800**	**5800**	470	--	--	3800	< 50	--	--	--	--	0.021	--	0.36	--
	03/27/01	--	--	760	**1500**	**3300**	100	--	--	2700	< 5	--	--	--	--	0.064	--	0.34	--
	06/05/02	--	--	790	**2600**	**4800**	1800	--	--	4300	< 8.6	--	--	--	--	0.1	--	0.21	< 0.0022
	05/15/03	--	--	129	**300**	200	21	--	--	670	< 1.2	--	--	--	--	0.61	--	0.61	0.051
	05/24/04	--	--	94	**210**	29	6.3	--	--	400	< 0.36	--	--	--	--	--	0.0073	--	--
	05/18/05	--	--	138	**270**	670	17	--	--	530	< 12	--	--	--	--	--	--	--	--
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	**180**	60	240	**330**	640	29	410	240	650	< 7.2	--	--	--	--	--	--	--	--
	05/16/07	1.9	1	2.9	6.4	1	< 0.36	5.9	0.84	6.74	< 0.36	--	--	--	--	--	--	--	--
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/26/09	**281**	86	367	**764**	**1640**	37	550	652	1202	< 9	< 250	< 250	65.2	1	--	0.0011	--	--
	01/26/10	**313**	95.5	408.5	**696**	**1650**	50	586	417	1003	< 3.8	< 6	< 250	34.6	< 0.41	--	< 0.0007	--	--
	04/27/10	**262**	85.5	347.5	**658**	**1610**	44	535	663	1198	< 6.1	3.8	101	36.3	0.62	--	< 0.0008	--	--
	07/26/10	**190**	57	247	**557**	**1430**	28.3	467	481	948	--	--	111	46	--	--	--	--	--
	11/02/10	13.6	< 2.1	--	**305**	59.4	4.4	10.5	< 4.5	--	< 1.5	--	159	53.7	--	--	--	--	--
	05/17/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--	< 0.38	--	108	4.2	--	--	--	--	--
	11/01/11	111	34.9	--	**290**	555	14.6	--	--	408	< 1.9	--	114	29.6	--	--	--	--	--
MW14	04/11/00	--	--	950	**310**	600	4000	--	--	4100	< 500	--	--	--	--	--	--	0.11	--
	03/27/01	--	--	1110	**410**	**810**	4200	--	--	4200	< 5	--	--	--	--	--	--	0.054	--

Table 3. Groundwater Screening for Vapor Intrusion Evaluation - PVOCs, Metals and Cyanide
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample Location	Sample Date	1,2,4-Trimethylbenzene (ug/l)	1,3,5-Trimethylbenzene (ug/l)	Trimethylbenzenes, Total (ug/l)	Benzene (ug/l)	Ethylbenzene (ug/l)	Toluene (ug/l)	Xylene, o (ug/l)	Xylenes, m + p (ug/l)	Xylenes, Total (ug/l)	Methyl-tert-butyl-ether (ug/l)	Aluminum, Dissolved (ug/l)	Iron, Dissolved (ug/l)	Manganese, Dissolved (ug/l)	Vanadium, Dissolved (ug/l)	Cyanide, Amenable (mg/l)	Cyanide, Available (mg/l)	Cyanide, Total (mg/l)	Cyanide, Weak Acid Diss. (mg/l)
Industrial Vapor Intrusion Screening (CR 1X10-6)		123	NS	NS	7.05	700	81000	14600	11000	10000	1960	NS	NS	NS	NS	NS	NS	NS	NS
MW17T	04/11/00	--	--	< 1	< 1	< 1	< 1	--	--	< 3	< 50	--	--	--	--	< 0.005	--	< 0.005	--
	03/27/01	--	--	< 1	< 1	< 1	< 1	--	--	< 3	< 5	--	--	--	--	< 0.02	--	0.054	--
	06/05/02	--	--	< 0.92	< 0.45	< 0.82	< 0.68	--	--	< 0.77	< 0.43	--	--	--	--	0.0026	--	0.0029	< 0.0022
	05/15/03	--	--	< 0.66	< 0.3	< 0.6	< 0.58	--	--	< 1.2	< 0.58	--	--	--	--	0.006	--	0.006	0.0019
	02/25/04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/24/04	--	--	< 0.4	< 0.14	< 0.4	< 0.36	--	--	< 0.74	< 0.36	--	--	--	--	--	< 0.005	--	--
	05/18/05	--	--	< 0.97	< 0.41	< 0.54	< 0.67	--	--	< 1.8	< 0.61	--	--	--	--	--	--	--	--
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	< 0.39	< 0.4	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	--	--	--	--	--	--	--	--
	05/16/07	< 0.39	< 0.4	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	--	--	--	--	--	--	--	--
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/26/09	< 0.39	< 0.4	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	< 6	< 6.2	48.6	0.75	--	< 0.0007	--	--
	01/26/10	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87	< 0.38	< 250	< 250	234	0.57	--	< 0.0007	--	--
	04/28/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	< 0.61	2.9	35	19.2	0.38	--	< 0.0008	--	--
	07/26/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	--	--	5	176	--	--	--	--	--
	11/02/10	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--	--	--	5.2	250	--	--	--	--	--
	05/17/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--	< 0.38	--	57.4	191	--	--	--	--	--
	11/01/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3	< 0.38	--	< 10.4	239	--	--	--	--	--
MW18T	04/11/00	--	--	< 1	< 1	< 1	< 1	--	--	< 3	< 50	--	--	--	--	< 0.005	--	< 0.005	--
	03/27/01	--	--	< 1	< 1	< 1	< 1	--	--	< 3	< 5	--	--	--	--	< 0.02	--	< 0.005	--
	06/05/02	--	--	< 0.92	< 0.45	< 0.82	< 0.68	--	--	< 0.77	< 0.43	--	--	--	--	< 0.0021	--	< 0.0021	< 0.0022
	05/15/03	--	--	< 0.66	< 0.3	< 0.6	< 0.58	--	--	< 1.2	< 0.58	--	--	--	--	0.0058	--	0.0058	0.0037
	02/25/04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/24/04	--	--	< 0.4	< 0.14	< 0.4	< 0.36	--	--	< 0.74	< 0.36	--	--	--	--	--	< 0.005	--	--
	05/18/05	--	--	< 0.97	< 0.41	< 0.54	< 0.67	--	--	< 1.8	< 0.61	--	--	--	--	--	--	--	--
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	< 0.39	< 0.4	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	--	--	--	--	--	--	--	--
	05/16/07	< 0.39	< 0.4	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	--	--	--	--	--	--	--	--
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/26/09	< 0.39	< 0.4	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	< 250	< 250	81.2	0.87	--	< 0.0007	--	--
	01/27/10	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87	< 0.38	< 250	< 250	86.2	0.72	--	< 0.0007	--	--
	04/27/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	< 0.61	2.7	29	102	0.53	--	< 0.0008	--	--
	07/26/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	--	--	< 4.5	82.4	--	--	--	--	--
	11/03/10	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--	< 0.61	--	22.5	102	--	--	--	--	--
	05/17/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--	< 0.38	--	12.8	152	--	--	--	--	--
	11/01/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3	< 0.38	--	< 10.4	9.9	--	--	--	--	--

Table 3. Groundwater Screening for Vapor Intrusion Evaluation - PVOCs, Metals and Cyanide
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample Location	Sample Date	1,2,4-Trimethylbenzene (ug/l)	1,3,5-Trimethylbenzene (ug/l)	Trimethylbenzenes, Total (ug/l)	Benzene (ug/l)	Ethylbenzene (ug/l)	Toluene (ug/l)	Xylene, o (ug/l)	Xylenes, m + p (ug/l)	Xylenes, Total (ug/l)	Methyl-tert-butyl-ether (ug/l)	Aluminum, Dissolved (ug/l)	Iron, Dissolved (ug/l)	Manganese, Dissolved (ug/l)	Vanadium, Dissolved (ug/l)	Cyanide, Amenable (mg/l)	Cyanide, Available (mg/l)	Cyanide, Total (mg/l)	Cyanide, Weak Acid Diss. (mg/l)
Industrial Vapor Intrusion Screening (CR 1X10-6)		123	NS	NS	7.05	700	81000	14600	11000	10000	1960	NS	NS	NS	NS	NS	NS	NS	NS
MW19T	04/11/00	--	--	< 1	< 1	< 1	< 1	--	--	< 3	< 50	--	--	--	--	< 0.005	--	0.037	--
	03/27/01	--	--	< 1	< 1	1.7	< 1	--	--	< 3	< 5	--	--	--	--	< 0.02	--	0.043	--
	06/05/02	--	--	< 0.92	2.4	< 0.82	< 0.68	--	--	0.94	< 0.43	--	--	--	--	0.029	--	0.029	0.0053
	05/15/03	--	--	< 0.66	< 0.3	< 0.6	< 0.58	--	--	< 1.2	< 0.58	--	--	--	--	0.035	--	0.035	0.0046
	02/25/04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/24/04	--	--	< 0.4	1.1	< 0.4	< 0.36	--	--	0.76	< 0.36	--	--	--	--	--	< 0.005	--	--
	05/18/05	--	--	< 0.97	< 0.41	< 0.54	< 0.67	--	--	< 1.8	< 0.61	--	--	--	--	--	--	--	--
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	< 0.39	< 0.4	< 0.4	0.17	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	--	--	--	--	--	--	--	--
	05/16/07	< 0.39	< 0.4	< 0.4	0.31	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	--	--	--	--	--	--	--	--
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/26/09	< 0.39	< 0.4	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	0.5	< 250	< 250	121	0.47	--	< 0.0007	--	--
	01/26/10	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87	< 0.38	< 250	< 250	63.4	< 0.41	--	< 0.0007	--	--
	04/28/10	< 0.97	< 0.83	< 0.97	0.99	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	< 0.61	4.6	34.9	35.1	0.75	--	< 0.0008	--	--
	07/26/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	--	--	30.4	42.7	--	--	--	--	--
	11/02/10	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--	--	--	17.5	22.5	--	--	--	--	--
	05/18/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--	< 0.38	--	14.4	29.6	--	--	--	--	--
	11/02/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3	< 0.38	--	12	315	--	--	--	--	--
MW20T	04/11/00	--	--	< 1	< 1	< 1	< 1	--	--	< 3	< 50	--	--	--	--	< 0.005	--	0.04	--
	03/27/01	--	--	< 1	< 1	< 1	< 1	--	--	< 3	< 5	--	--	--	--	0.027	--	0.061	--
	06/05/02	--	--	< 0.92	< 0.45	< 0.82	< 0.68	--	--	< 0.77	< 0.43	--	--	--	--	0.037	--	0.063	< 0.0022
	05/15/03	--	--	< 0.66	< 0.3	< 0.6	< 0.58	--	--	< 1.2	< 0.58	--	--	--	--	0.051	--	0.051	0.0046
	02/25/04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/24/04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/25/04	--	--	< 0.4	< 0.14	< 0.4	< 0.36	--	--	< 0.74	< 0.36	--	--	--	--	--	< 0.005	--	--
	05/18/05	--	--	< 0.97	< 0.41	< 0.54	< 0.67	--	--	< 1.8	< 0.61	--	--	--	--	--	--	--	--
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	< 0.39	< 0.4	< 0.4	0.22	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	0.88	--	--	--	--	--	--	--	--
	05/16/07	< 0.39	< 0.4	< 0.4	0.19	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	0.8	--	--	--	--	--	--	--	--
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/26/09	< 0.39	< 0.4	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	1.9	< 6	< 250	216	0.61	--	< 0.0007	--	--
	01/26/10	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87	0.8	< 6	< 250	33.9	< 0.41	--	< 0.0007	--	--
	04/28/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	< 0.61	3.4	43.9	108	0.41	--	< 0.0008	--	--
	07/26/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	--	--	15.3	225	--	--	--	--	--
	11/02/10	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--	--	--	11.2	255	--	--	--	--	--
	05/18/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--	3.7	--	78	277	--	--	--	--	--
	11/01/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3	1.6	--	15.1	244	--	--	--	--	--

Table 3. Groundwater Screening for Vapor Intrusion Evaluation - PVOCs, Metals and Cyanide
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample Location	Sample Date	1,2,4-Trimethylbenzene (ug/l)	1,3,5-Trimethylbenzene (ug/l)	Trimethylbenzenes, Total (ug/l)	Benzene (ug/l)	Ethylbenzene (ug/l)	Toluene (ug/l)	Xylene, o (ug/l)	Xylenes, m + p (ug/l)	Xylenes, Total (ug/l)	Methyl-tert-butyl-ether (ug/l)	Aluminum, Dissolved (ug/l)	Iron, Dissolved (ug/l)	Manganese, Dissolved (ug/l)	Vanadium, Dissolved (ug/l)	Cyanide, Amenable (mg/l)	Cyanide, Available (mg/l)	Cyanide, Total (mg/l)	Cyanide, Weak Acid Diss. (mg/l)
Industrial Vapor Intrusion Screening (CR 1X10-6)		123	NS	NS	7.05	700	81000	14600	11000	10000	1960	NS	NS	NS	NS	NS	NS	NS	NS
MW21T	04/11/00	--	--	< 1	< 1	< 1	< 1	--	--	< 3	< 50	--	--	--	--	< 0.005	--	0.061	--
	03/27/01	--	--	< 1	< 1	< 1	< 1	--	--	< 3	< 5	--	--	--	--	0.029	--	0.075	--
	06/05/02	--	--	< 0.92	< 0.45	< 0.82	< 0.68	--	--	< 0.77	1.9	--	--	--	--	0.14	--	0.18	< 0.0022
	05/15/03	--	--	< 0.66	0.31	< 0.6	< 0.58	--	--	< 1.2	1.6	--	--	--	--	0.37	--	0.37	0.026
	02/25/04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/24/04	--	--	< 0.4	< 0.14	< 0.4	< 0.36	--	--	< 0.74	< 0.36	--	--	--	--	--	< 0.005	--	--
	05/18/05	--	--	< 0.97	< 0.41	< 0.54	< 0.67	--	--	< 1.8	< 0.61	--	--	--	--	--	--	--	--
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	< 0.39	< 0.4	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	--	--	--	--	--	--	--	--
	05/16/07	< 0.39	< 0.4	< 0.4	0.19	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	1.8	--	--	--	--	--	--	--	--
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/26/09	< 0.39	< 0.4	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	0.45	< 250	443	300	0.56	--	< 0.0007	--	--
	01/27/10	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87	1.3	250	261	295	0.52	--	< 0.0007	--	--
	04/27/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	< 0.61	4.6	704	212	0.13	--	0.0025	--	--
	07/26/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	--	--	2300	107	--	--	--	--	--
	11/03/10	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--	< 0.61	--	160	161	--	--	--	--	--
	05/18/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--	2.1	--	633	194	--	--	--	--	--
	11/02/11	< 0.43	< 0.4	--	0.48	< 0.41	< 0.42	--	--	< 1.3	2.7	--	3900	153	--	--	--	--	--
PZ07B	10/26/09	< 0.39	< 0.4	< 0.4	**11.6**	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	< 250	687	57.8	< 0.41	--	0.0015	--	--
	01/27/10	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87	< 0.38	< 250	< 250	2.9	< 0.41	--	< 0.0007	--	--
	04/27/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	< 0.61	3.9	56	0.87	0.69	--	< 0.0008	--	--
	07/26/10	< 0.97	< 0.83	< 0.97	6.6	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	--	--	94.9	67.1	--	--	--	--	--
	11/02/10	< 0.97	< 0.83	--	**11.3**	< 0.54	< 0.67	< 0.83	< 1.8	--	--	--	1870	92.7	--	--	--	--	--
	05/17/11	< 0.43	< 0.4	--	**11.4**	< 0.41	< 0.42	< 0.38	< 0.87	--	< 0.38	--	1670	75.6	--	--	--	--	--
	11/01/11	< 0.43	< 0.4	--	**8.5**	< 0.41	< 0.42	--	--	< 1.3	< 0.38	--	57.9	68.4	--	--	--	--	--
PZ18TB	10/26/09	< 0.39	< 0.4	< 0.4	0.25	< 0.4	0.58	< 0.36	< 0.74	< 0.74	< 0.36	< 250	< 250	73.6	0.61	--	< 0.0007	--	--
	01/27/10	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87	< 0.38	< 6	310	202	< 0.41	--	< 0.0007	--	--
	04/27/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	< 0.61	5.7	28.6	91.3	0.075	--	< 0.0008	--	--
	07/26/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	--	--	5.6	99	--	--	--	--	--
	11/03/10	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--	< 0.61	--	179	349	--	--	--	--	--
	05/17/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--	< 0.38	--	1130	356	--	--	--	--	--
	11/01/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3	< 0.38	--	< 10.4	0.61	--	--	--	--	--
PZ23B	10/27/09	< 0.39	< 0.4	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	< 0.36	< 250	< 250	49.2	0.86	--	< 0.0007	--	--
	01/26/10	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87	< 0.38	< 6	< 6.2	83.6	< 0.41	--	< 0.0007	--	--
	04/28/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	< 0.61	3.9	6.3	877	0.71	--	< 0.0008	--	--
	07/27/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	--	--	396	60.3	--	--	--	--	--
	11/03/10	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--	< 0.61	--	15.5	9.9	--	--	--	--	--
	05/18/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--	< 0.38	--	93.9	19.3	--	--	--	--	--
	11/02/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3	< 0.38	--	< 10.4	4.6	--	--	--	--	--
PZ24	10/27/09	< 0.39	< 0.4	< 0.4	0.41	< 0.4	0.37	< 0.36	< 0.74	< 0.74	< 0.36	< 250	< 250	47.9	1.1	--	< 0.0007	--	--
	01/26/10	< 0.43	< 0.4	< 0.43	0.41	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87	< 0.38	< 6	< 250	48.3	0.6	--	< 0.0007	--	--
	04/28/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	< 0.61	3.1	26.5	66.9	0.67	--	< 0.0008	--	--
	07/27/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	--	--	2590	187	--	--	--	--	--
	11/03/10	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--	< 0.61	--	< 4.5	42.2	--	--	--	--	--
	05/18/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--	< 0.38	--	< 7.8	41.6	--	--	--	--	--
	11/02/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3	< 0.38	--	< 10.4	39.6	--	--	--	--	--

Table 3. Groundwater Screening for Vapor Intrusion Evaluation - PVOCs, Metals and Cyanide
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample Location	Sample Date	1,2,4-Trimethylbenzene (ug/l)	1,3,5-Trimethylbenzene (ug/l)	Trimethylbenzenes, Total (ug/l)	Benzene (ug/l)	Ethylbenzene (ug/l)	Toluene (ug/l)	Xylene, o (ug/l)	Xylenes, m + p (ug/l)	Xylenes, Total (ug/l)	Methyl-tert-butyl-ether (ug/l)	Aluminum, Dissolved (ug/l)	Iron, Dissolved (ug/l)	Manganese, Dissolved (ug/l)	Vanadium, Dissolved (ug/l)	Cyanide, Amenable (mg/l)	Cyanide, Available (mg/l)	Cyanide, Total (mg/l)	Cyanide, Weak Acid Diss. (mg/l)
Industrial Vapor Intrusion Screening (CR 1X10-6)		123	NS	NS	7.05	700	81000	14600	11000	10000	1960	NS	NS	NS	NS	NS	NS	NS	NS
PZ25	10/27/09	31	11.6	42.6	**21.8**	28.3	28.3	24.8	46.6	70.4	3	< 250	873	149	0.52	--	< 0.0007	--	--
	01/27/10	9.5	3.8	13.3	6.8	10.3	6.2	8.7	13.4	22.1	1.2	< 250	< 250	84.4	0.77	--	< 0.0007	--	--
	04/28/10	8.9	3.5	12.4	5.6	10.9	4.2	7.9	12.3	20.2	< 0.61	6.8	414	95.6	0.62	--	--	--	--
	07/27/10	10.8	< 8.3	10.8	**10**	9.8	< 6.7	< 8.3	< 18	< 8.3	--	--	< 4.5	44.2	--	--	--	--	--
	11/03/10	2	< 0.83	--	5.6	2.6	0.96	< 0.83	< 1.8	--	< 0.61	--	2070	73.6	--	--	--	--	--
	05/18/11	1.2	0.53	--	1.9	1.3	0.73	0.84	0.96	--	0.48	--	87.8	51.5	--	--	--	--	--
	11/02/11	4	1.3	--	6.8	< 0.41	< 0.42	--	--	4.4	1.8	--	2320	73	--	--	--	--	--
PZ26	10/27/09	< 0.39	< 0.4	< 0.4	0.26	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74	2.9	< 6	2660	174	< 0.41	--	< 0.0007	--	--
	01/27/10	< 0.43	< 0.4	< 0.43	0.62	< 0.41	0.55	< 0.38	< 0.87	< 0.87	1.5	< 6	1740	200	< 0.41	--	< 0.0007	--	--
	04/28/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	< 0.61	4.4	2070	212	0.24	--	--	--	--
	07/27/10	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8	--	--	686	0.2	--	--	--	--	--
	11/03/10	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--	< 0.61	--	2560	208	--	--	--	--	--
	05/18/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--	2.3	--	2390	201	--	--	--	--	--
	11/02/11	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3	0.85	--	< 10.4	24.4	--	--	--	--	--

NOTES:
< 2.0: Parameter not detected above the limit of detection indicated.
--: Analysis not performed.
NS: No screening level exists for this pararmeter.
Concentrations exceeding the screening level are **BOLD.**

Table 4. Groundwater Screening for Vapor Intrusion Evaluation - Polynuclear Aromatic Hydrocarbons (PAHs)
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample Location	Sample Date	1-Methylnaphthalene (ug/l)	2-methylnaphthalene (ug/l)	Acenaphthene (ug/l)	Acenaphthylene (ug/l)	Anthracene (ug/l)	Benzo(a)anthracene (ug/l)	Benzo(a)pyrene (ug/l)	Benzo(b)fluoranthene (ug/l)	Benzo(ghi)perylene (ug/l)	Benzo(k)fluoranthene (ug/l)	Chrysene (ug/l)	Dibenz(a,h)anthracene (ug/l)	Fluoranthene (ug/l)	Fluorene (ug/l)	Indeno(1,2,3-cd)pyrene (ug/l)	Naphthalene (PAH) (ug/l)	Phenanthrene (ug/l)	Pyrene (ug/l)
Industrial Vapor Intrusion Screening (CR 1X10-6)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	20	NS	NS
MW01	03/27/01	--	< 5	< 5	< 5	< 5	2.4	3	5.8	< 5	< 5	< 5	< 2	7.7	< 5	2.3	< 5	< 5	6
	06/05/02	< 0.54	< 0.56	2.7	0.48	< 8	29	46	55	40	43	48	11	100	4.5	34	< 0.54	53	86
	11/19/03	< 0.36	< 0.34	< 0.36	< 0.38	0.7	5.2	8.2	8.6	6.9	6.5	6.6	2	14	< 0.34	6.1	< 0.48	4.6	9.1
	02/25/04	< 0.34	< 0.32	0.99	0.43	4	13	19	16	14	17	19	4.3	45	1.6	12	2.3	21	32
	05/24/04	< 0.34	< 0.32	< 0.34	< 0.36	0.58	3.7	5.3	5	4.3	4.4	4.5	1.3	8.1	< 0.32	3.9	< 0.45	3	6
	05/18/05	< 0.8	< 0.9	< 0.78	< 0.77	0.75	4.4	10	11	9.8	10	8.9	2.1	13	< 0.87	7.8	< 0.89	4.7	9.5
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	< 1	< 1.1	< 0.82	< 0.81	2.4	11	18	20	16	18	17	3.5	32	< 0.91	13	< 1.2	9.2	23
	05/16/07	0.95	1.5	< 0.16	0.27	0.77	2.2	4.9	6.2	5.3	4.3	4.2	1.2	7.4	0.25	4.5	1.7	2.6	5.5
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/27/09	< 0.1	< 0.077	0.1	0.22	0.76	3.8	7.8	10.7	6.8	6.8	6.6	1.4	12	0.18	5.8	< 0.097	3.1	9.2
	04/27/10	0.0062	0.004	0.006	0.022	0.061	0.27	0.61	0.9	0.87	0.77	0.62	0.17	1.1	0.01	0.68	0.0096	0.23	0.8
	07/27/10	0.035	0.026	0.025	0.018	0.0099	0.012	0.027	0.045	0.034	0.035	0.033	0.0061	0.045	0.017	0.024	0.22	0.036	0.037
	11/03/10	0.0063	0.011	< 0.0045	0.0051	0.0088	0.02	0.053	0.063	0.065	0.07	0.057	0.014	0.068	< 0.0048	0.047	0.041	0.02	0.063
	05/18/11	0.0052	0.0096	< 0.0045	0.0076	0.0067	0.03	0.058	0.088	0.075	0.063	0.052	0.017	0.073	0.0052	0.061	0.021	0.024	0.064
	11/02/11	< 0.005	0.0069	< 0.0045	< 0.0036	< 0.0057	0.011	0.02	0.029	0.027	0.026	0.027	0.0073	0.025	< 0.0048	0.02	0.036	0.01	0.024
MW02	04/11/00	--	< 1	1.7	1.8	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
	03/27/01	--	8.6	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
	06/05/02	14	0.035	5.4	4	0.067	0.15	0.17	0.16	0.12	0.11	0.12	0.046	0.28	0.94	0.12	0.18	0.21	0.25
	05/15/03	9.2	0.023	3.8	2.3	0.055	0.12	0.14	0.14	0.11	0.1	0.12	0.033	0.23	0.65	0.1	0.19	0.13	0.22
	02/25/04	11	0.025	4.9	2.8	0.04	0.083	0.1	0.1	0.091	0.09	0.088	0.024	0.17	0.81	0.079	0.2	0.13	0.17
	05/24/04	10	0.019	4.8	2.8	0.42	1.5	1.4	1.1	0.86	1.1	1.4	0.28	3.3	0.87	0.76	0.19	1.4	2.7
	05/18/05	11	< 0.45	4.2	2.7	< 0.35	1.1	1.2	1.1	0.94	1.1	1.1	< 0.44	2.3	0.52	0.77	0.71	0.74	2
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	10	< 0.46	5.6	3.5	0.7	2.4	2.4	2.2	1.4	2.1	2.3	< 0.77	5.5	0.77	1.3	< 0.5	1.6	4.4
	05/16/07	2.8	< 0.056	1.7	0.95	0.18	0.66	0.74	0.67	0.5	0.61	0.6	0.15	1.5	0.32	0.49	0.12	0.58	1.2
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/27/09	20.9	< 0.39	9.7	5.5	< 0.57	< 0.36	< 0.29	< 0.34	< 0.48	< 0.44	< 0.35	< 0.32	< 0.44	1	< 0.47	< 0.48	< 0.81	< 0.47
	01/27/10	5.7	0.075	2.5	1.4	0.055	0.043	0.052	0.064	0.056	0.054	0.055	0.012	0.16	0.28	0.045	0.59	0.056	0.14
	04/27/10	3.5	0.0085	1.4	0.69	0.016	0.039	0.06	0.06	0.064	0.08	0.066	0.014	0.11	0.11	0.049	0.052	0.039	0.091
	07/26/10	2.8	0.0085	3.3	1.7	0.023	< 0.0036	0.004	0.0057	< 0.0048	< 0.0044	0.0048	< 0.0032	0.0074	0.026	< 0.0047	0.11	< 0.0081	0.02
	11/03/10	13.2	< 0.077	5.2	2.8	< 0.11	< 0.072	< 0.057	< 0.068	< 0.096	< 0.087	< 0.07	< 0.064	< 0.088	0.52	< 0.094	0.29	< 0.16	< 0.095
	05/18/11	4.2	4.2	1.6	0.82	< 0.11	< 0.072	< 0.057	< 0.068	< 0.096	< 0.087	< 0.07	< 0.064	< 0.088	0.12	< 0.094	0.17	< 0.16	< 0.095
	11/02/11	2.9	0.0095	0.85	0.52	0.015	0.0046	0.0042	0.0052	< 0.0048	0.0045	0.0073	< 0.0032	0.011	0.069	< 0.0047	0.15	0.011	0.011
MW05	06/05/02	< 0.4	< 0.42	< 0.27	< 0.34	< 0.3	1.7	2.1	2.5	1.9	1.6	1.8	0.56	4.1	< 0.32	1.6	< 0.4	1.5	3.1
	05/15/03	0.033	0.035	0.2	0.053	0.26	1.1	1.5	2.3	1.5	1.9	2.3	0.49	5.1	0.24	1.1	0.072	2.8	3.6
	02/25/04	< 0.17	< 0.16	< 0.17	< 0.18	< 0.19	1	1.6	1.6	1.4	1.6	1.6	0.39	3	< 0.16	1.2	0.28	0.87	2.1
	05/24/04	< 0.017	0.017	0.068	0.022	0.11	0.62	0.89	1.2	0.83	0.95	1.1	0.23	2.2	0.075	0.72	0.03	0.92	1.6
	05/18/05	< 8.5	< 9.6	< 8.2	< 8.2	< 7.5	25	58	110	75	98	110	18	190	< 9.2	60	< 9.5	48	120
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	< 5.1	< 5.6	< 4.1	< 4.1	6.7	29	56	99	62	73	84	12	160	< 4.5	51	< 6.2	40	110
	05/16/07	< 5.1	< 5.6	< 4.1	< 4.1	8.6	17	45	60	46	56	58	10	96	< 4.5	38	< 6.2	28	66
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/27/09	< 0.5	< 0.39	< 0.45	< 0.36	1.3	6.9	14.8	21.2	14.1	13	15.4	2.7	26.7	< 0.48	12	< 0.48	7.2	19.3
	01/27/10	< 0.005	0.0054	0.011	0.023	0.061	0.37	0.7	1	0.79	0.84	0.86	0.22	1.5	0.018	0.77	< 0.047	0.34	1.2
	04/27/10	< 0.005	0.005	0.013	0.029	0.12	0.5	0.9	1.4	1.3	1.2	1.1	0.27	1.9	0.018	0.95	0.019	0.42	1.5
	07/26/10	0.006	0.0059	0.0054	0.0079	0.01	0.044	0.067	0.097	0.072	0.071	0.077	0.017	0.12	< 0.0048	0.058	0.017	0.038	0.09
	11/03/10	0.0091	0.016	< 0.0045	< 0.0036	< 0.0057	0.021	0.052	0.089	0.068	0.062	0.07	0.014	0.078	< 0.0048	0.049	0.031	0.019	0.066
	05/18/11	0.0068	0.011	0.0068	0.0058	0.014	0.077	0.15	0.28	0.21	0.19	0.19	0.044	0.29	0.0079	0.17	0.031	0.083	0.23
	11/02/11	< 0.005	0.0064	< 0.0045	< 0.0036	< 0.0057	0.0049	0.0076	0.012	0.0085	0.01	0.012	< 0.0032	0.014	< 0.0048	0.0064	0.019	< 0.0081	0.011

Table 4. Groundwater Screening for Vapor Intrusion Evaluation - Polynuclear Aromatic Hydrocarbons (PAHs)
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample Location	Sample Date	1-Methylnaphthalene (ug/l)	2-methylnaphthalene (ug/l)	Acenaphthene (ug/l)	Acenaphthylene (ug/l)	Anthracene (ug/l)	Benzo(a)anthracene (ug/l)	Benzo(a)pyrene (ug/l)	Benzo(b)fluoranthene (ug/l)	Benzo(ghi)perylene (ug/l)	Benzo(k)fluoranthene (ug/l)	Chrysene (ug/l)	Dibenz(a,h)anthracene (ug/l)	Fluoranthene (ug/l)	Fluorene (ug/l)	Indeno(1,2,3-cd)pyrene (ug/l)	Naphthalene (PAH) (ug/l)	Phenanthrene (ug/l)	Pyrene (ug/l)
Industrial Vapor Intrusion Screening (CR 1X10-6)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	20	NS	NS
MW06	04/11/00	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
	03/27/01	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
	10/25/01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	06/05/02	< 0.027	< 0.028	< 0.018	0.04	< 0.02	0.032	0.032	0.029	0.047	0.023	0.027	< 0.017	0.069	< 0.021	0.02	< 0.027	0.033	0.059
	05/15/03	< 0.018	< 0.017	< 0.018	0.043	< 0.02	0.032	0.041	0.042	0.032	0.033	0.034	< 0.016	0.058	< 0.017	0.027	0.051	0.029	0.056
	02/25/04	0.018	0.026	< 0.017	0.067	< 0.019	0.023	0.026	0.024	0.021	0.019	0.022	< 0.015	0.045	< 0.016	< 0.02	0.09	0.029	0.04
MW07	04/11/00	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
	03/27/01	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
	06/05/02	< 0.027	< 0.028	< 0.018	0.3	0.13	0.39	0.53	0.41	0.43	0.32	0.31	0.14	0.4	< 0.021	0.36	0.029	0.097	0.53
	05/15/03	< 0.018	< 0.017	< 0.018	0.11	0.13	0.22	0.44	0.67	0.54	0.44	0.54	0.12	0.87	< 0.017	0.43	0.026	0.2	0.69
	02/25/04	< 0.017	0.022	0.037	0.24	0.26	1.5	3	4.7	3.4	3.3	4.2	0.65	9.2	0.059	2.8	0.097	2	6
	10/26/09	< 0.1	< 0.077	< 0.091	0.6	0.8	3	8.8	12	10.7	8.9	8	1.7	12.2	0.11	8.5	< 0.17	1.9	9.4
	01/27/10	0.029	0.0073	0.0076	0.032	0.072	0.026	0.058	0.095	0.1	0.075	0.071	0.024	0.081	< 0.0049	0.079	< 0.049	0.013	0.073
	04/27/10	0.0071	0.0073	0.01	0.015	0.024	0.07	0.17	0.33	0.27	0.24	0.23	0.053	0.3	0.0072	0.2	0.017	0.051	0.24
	07/26/10	< 0.005	0.0042	< 0.0045	0.043	0.077	0.06	0.14	0.23	0.22	0.17	0.15	0.059	0.18	< 0.0048	0.16	0.011	0.028	0.15
	11/02/10	< 0.005	0.0052	< 0.0045	0.024	0.046	0.0063	0.015	0.023	0.019	0.019	0.018	< 0.0032	0.023	< 0.0048	0.014	0.01	< 0.0081	0.023
	05/17/11	< 0.005	0.004	< 0.0045	0.032	0.038	0.035	0.069	0.12	0.11	0.095	0.079	0.021	0.1	< 0.0048	0.078	0.013	0.018	0.088
	11/01/11	0.0094	0.0095	< 0.0045	0.059	0.092	0.021	0.055	0.091	0.093	0.067	0.063	0.019	0.086	0.0054	0.065	0.021	0.016	0.082
MW08	04/11/00	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
	03/27/01	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
	06/05/02	< 0.67	< 0.7	< 0.45	1	1	3.7	4	3	2.5	2.5	2.7	0.73	7	< 0.53	2.4	< 0.67	2	5.9
	05/15/03	< 0.18	< 0.17	< 0.18	0.61	0.43	1.5	2	1.6	1.5	1.4	1.4	0.34	2.7	< 0.17	1.3	< 0.24	0.7	2.6
	05/24/04	< 0.34	< 0.32	< 0.34	1	0.68	2.3	2.8	2.3	2	1.8	2	0.56	4.4	< 0.32	1.8	< 0.45	1.2	3.9
	05/18/05	< 0.8	< 0.91	< 0.78	2	1.8	5.5	7.8	6.2	5.6	6.6	6.3	1.2	13	< 0.87	4.5	< 0.89	3.7	12
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	< 0.41	< 0.46	< 0.33	1.6	1.6	4.4	5.2	4.6	3.4	3.6	3.9	0.81	9.5	< 0.37	2.9	< 0.5	2.8	8
	05/16/07	0.023	0.044	0.042	1	0.66	2.5	4	3	2.7	3.2	2.7	0.56	5.4	0.081	2.4	0.071	1.2	4.8
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/26/09	< 0.047	< 0.047	0.026	0.33	0.34	0.98	1.4	1.4	0.91	0.81	0.98	0.19	1.9	0.058	0.8	0.57	0.4	1.8
	01/27/10	0.014	0.0063	< 0.0045	0.016	0.045	0.031	0.047	0.065	0.059	0.053	0.05	0.014	0.062	< 0.0048	0.049	< 0.047	0.014	0.061
	04/27/10	< 0.005	0.0084	< 0.0045	0.016	0.057	0.014	0.026	0.031	0.034	0.035	0.029	0.005	0.047	< 0.0048	0.025	0.015	0.0099	0.045
	07/26/10	< 0.005	0.0064	0.006	0.033	0.1	0.073	0.087	0.11	0.092	0.089	0.089	0.029	0.15	0.01	0.074	0.012	0.036	0.14
	11/02/10	< 0.005	0.0042	< 0.0045	0.01	0.024	0.0077	0.011	0.0092	0.011	0.014	0.012	< 0.0032	0.017	< 0.0048	0.0083	0.012	< 0.0081	0.02
	05/17/11	< 0.005	< 0.0039	< 0.0045	0.012	0.037	0.017	0.021	0.027	0.024	0.023	0.02	0.0057	0.035	< 0.0048	0.018	0.0081	0.0092	0.031
	11/01/11	< 0.005	0.0058	< 0.0045	0.019	0.069	0.0056	0.0055	0.0082	0.0072	0.0063	0.0065	< 0.0032	0.017	< 0.0048	0.0055	0.022	< 0.0081	0.017
MW09	04/11/00	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
	03/27/01	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
	06/05/02	0.039	< 0.028	0.14	0.21	0.22	0.87	0.96	0.97	0.75	0.6	0.75	0.31	2.1	0.041	0.65	0.12	0.41	1.8
	05/15/03	< 1.8	< 1.7	< 1.8	< 1.9	2.2	10	12	12	9.5	11	13	2.4	29	< 1.7	7.7	< 2.4	10	23
	02/25/04	< 0.091	< 0.086	< 0.091	< 0.096	< 0.1	0.21	0.44	0.72	0.54	0.48	0.59	0.098	1.3	< 0.086	0.45	< 0.12	0.25	0.94
	05/24/04	0.11	0.046	0.19	0.29	0.38	1.5	2.6	3.4	2.6	2.6	2.9	0.66	5.5	0.086	2.2	0.35	1	4.1
	05/18/05	< 0.16	< 0.18	< 0.16	0.19	0.29	0.94	1.9	2.5	2.2	2	1.9	0.45	3.1	< 0.17	1.7	< 0.18	0.58	2.4
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	< 0.2	< 0.22	< 0.16	0.18	0.28	1.3	2.9	4.6	3.3	3.1	3.4	0.63	5.6	< 0.18	2.6	0.38	0.91	3.8
	05/16/07	0.14	< 0.11	0.2	0.26	0.29	0.42	0.78	1.1	0.9	0.92	0.79	0.2	1.8	0.14	0.79	0.25	0.66	1.4
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/26/09	< 0.38	< 0.031	0.13	0.19	0.23	0.42	1	1.3	1.1	1.1	0.92	0.22	1.5	< 0.038	0.91	< 0.17	0.21	1.2
	01/27/10	0.0059	0.0051	0.05	0.039	0.091	0.052	0.1	0.16	0.15	0.13	0.11	0.036	0.15	< 0.0048	0.12	< 0.047	0.019	0.12
	04/27/10	< 0.005	0.0051	0.011	0.037	0.078	0.0085	0.017	0.029	0.024	0.028	0.024	0.0037	0.045	< 0.0048	0.017	0.0089	< 0.0081	0.036

Table 4. Groundwater Screening for Vapor Intrusion Evaluation - Polynuclear Aromatic Hydrocarbons (PAHs)
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample Location	Sample Date	1-Methylnaphthalene (ug/l)	2-methylnaphthalene (ug/l)	Acenaphthene (ug/l)	Acenaphthylene (ug/l)	Anthracene (ug/l)	Benzo(a)anthracene (ug/l)	Benzo(a)pyrene (ug/l)	Benzo(b)fluoranthene (ug/l)	Benzo(ghi)perylene (ug/l)	Benzo(k)fluoranthene (ug/l)	Chrysene (ug/l)	Dibenz(a,h)anthracene (ug/l)	Fluoranthene (ug/l)	Fluorene (ug/l)	Indeno(1,2,3-cd)pyrene (ug/l)	Naphthalene (PAH) (ug/l)	Phenanthrene (ug/l)	Pyrene (ug/l)
Industrial Vapor Intrusion Screening (CR 1X10-6)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	20	NS	NS
MW10	04/11/00	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
	03/27/01	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
	06/05/02	< 0.09	< 0.093	0.85	0.38	0.29	0.42	0.43	0.32	0.34	0.23	0.27	0.095	1	0.64	0.28	0.09	0.16	1
	05/15/03	0.28	< 0.085	0.86	0.38	0.32	0.65	0.8	0.83	0.68	0.64	0.73	0.18	1.3	0.47	0.56	0.28	0.33	1.4
	02/25/04	0.14	0.17	0.55	0.43	0.29	0.93	1.4	1.7	1.4	1.3	1.5	0.33	3.1	0.43	1.1	0.39	0.75	2.4
	05/24/04	0.21	0.04	0.77	0.29	0.26	0.71	1.2	1.4	1.2	1.3	1.4	0.31	2.8	0.37	0.96	0.47	0.57	2.2
	05/18/05	0.45	< 0.23	0.66	0.7	0.49	1.2	2	2.3	2.1	2	2.1	0.39	3.8	0.31	1.6	0.25	0.84	3.2
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	0.17	< 0.056	0.81	0.38	0.3	0.67	1.1	1.2	1	1	1	0.2	2.1	0.34	0.79	0.087	0.37	1.7
	05/16/07	0.82	0.13	0.63	0.17	0.17	0.33	0.58	0.71	0.64	0.6	0.51	0.15	1	0.16	0.54	0.13	0.24	0.77
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/26/09	0.67	0.13	0.93	0.39	0.55	1.9	4.4	6.3	4.7	3.5	3.9	0.9	5.8	0.39	3.9	< 0.17	1.1	5.1
	01/27/10	0.24	0.041	0.3	0.028	0.12	0.12	0.23	0.35	0.32	0.3	0.28	0.085	0.42	0.062	0.27	0.071	0.069	0.36
	04/27/10	0.87	0.1	0.45	0.033	0.077	0.042	0.081	0.11	0.12	0.13	0.1	0.024	0.17	0.052	0.082	0.46	0.052	0.15
	07/26/10	0.97	0.1	0.46	0.054	0.21	0.085	0.15	0.26	0.21	0.2	0.2	0.04	0.3	0.059	0.15	0.14	0.088	0.27
	11/02/10	0.54	0.064	0.39	0.03	0.13	0.014	0.014	0.018	0.016	0.021	0.024	< 0.0032	0.11	0.054	0.011	0.11	0.053	0.11
	05/17/11	0.49	0.046	0.29	0.026	0.049	0.013	0.013	0.023	0.017	0.017	0.017	0.0047	0.052	0.029	0.013	0.038	0.026	0.051
	11/01/11	0.64	0.073	0.47	0.044	0.13	0.02	0.027	0.037	0.033	0.03	0.034	0.0071	0.13	0.083	0.025	0.12	0.076	0.14
MW11	04/11/00	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
	03/27/01	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
	06/05/02	0.25	< 0.028	0.16	0.32	0.11	0.18	0.2	0.16	0.16	0.12	0.15	0.047	0.39	0.05	0.13	0.048	0.09	0.45
	05/15/03	0.28	0.026	0.35	0.25	0.13	0.39	0.53	0.64	0.52	0.49	0.49	0.14	0.89	0.12	0.46	0.046	0.17	0.8
	02/25/04	0.047	0.035	0.096	0.23	0.069	0.1	0.14	0.15	0.14	0.12	0.13	0.035	0.3	0.1	0.11	0.087	0.11	0.26
	05/24/04	0.1	0.019	0.23	0.27	0.14	0.26	0.42	0.46	0.45	0.35	0.4	0.12	0.72	0.15	0.38	0.033	0.15	0.64
MW12	04/11/00	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
	03/27/01	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
	06/05/02	< 0.027	< 0.028	< 0.018	0.025	0.053	0.61	0.65	0.8	0.59	0.48	0.53	0.21	1	< 0.021	0.49	0.056	0.23	1.1
	05/24/04	< 0.34	< 0.32	< 0.34	< 0.36	< 0.38	2.7	5.2	6.2	5.3	4.7	4.7	1.4	7.7	< 0.32	4.6	< 0.45	1.6	5.8
	05/18/05	< 0.8	< 0.91	< 0.78	< 0.77	< 0.71	4.5	9.5	11	11	10	8.9	2.2	13	< 0.87	8.3	< 0.89	2.5	10
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	06/20/06	< 0.81	< 0.9	< 0.65	< 0.65	1.8	5.6	13	16	20	13	12	3.9	19	< 0.72	15	< 0.99	3.4	15
	05/16/07	< 0.2	< 0.22	< 0.16	0.22	0.47	3.1	7.4	9.4	5	6.6	5.7	1.8	9	< 0.18	7.9	< 0.25	1.7	6.8
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/27/09	< 0.2	< 0.15	< 0.18	0.44	0.89	5.7	13.7	15.3	17.7	11.3	10.3	2.8	16.4	< 0.19	12.9	< 1.9	3.1	13
	01/26/10	0.01	0.012	0.0092	0.064	0.17	0.65	1.4	1.7	2.5	1.6	1.4	0.47	2.1	0.02	1.7	< 0.047	0.37	1.8
	04/27/10	0.012	0.0078	0.0051	0.0089	0.077	0.08	0.17	0.24	0.3	0.17	0.16	0.05	0.25	< 0.0048	0.2	0.067	0.042	0.2
	07/27/10	< 0.02	< 0.015	< 0.018	0.023	0.095	0.37	0.83	1	0.96	0.77	0.71	0.17	0.89	< 0.019	0.7	< 0.019	0.12	0.72
	11/03/10	0.02	0.037	< 0.0045	0.0048	0.052	0.0091	0.018	0.027	0.03	0.028	0.026	0.0054	0.027	< 0.0048	0.021	0.11	< 0.0081	0.024
	05/17/11	< 0.005	0.0049	0.0077	0.015	0.057	0.3	0.55	0.76	0.77	0.54	0.44	0.18	0.68	0.0094	0.59	0.013	0.14	0.56
	11/01/11	0.18	0.051	0.063	0.0039	0.017	0.0043	0.0081	0.011	0.012	0.0087	0.009	< 0.0032	0.01	0.0087	0.0079	0.085	< 0.0081	0.0092

Table 4. Groundwater Screening for Vapor Intrusion Evaluation - Polynuclear Aromatic Hydrocarbons (PAHs)
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample Location	Sample Date	1-Methylnaphthalene (ug/l)	2-methylnaphthalene (ug/l)	Acenaphthene (ug/l)	Acenaphthylene (ug/l)	Anthracene (ug/l)	Benzo(a)anthracene (ug/l)	Benzo(a)pyrene (ug/l)	Benzo(b)fluoranthene (ug/l)	Benzo(ghi)perylene (ug/l)	Benzo(k)fluoranthene (ug/l)	Chrysene (ug/l)	Dibenz(a,h)anthracene (ug/l)	Fluoranthene (ug/l)	Fluorene (ug/l)	Indeno(1,2,3-cd)pyrene (ug/l)	Naphthalene (PAH) (ug/l)	Phenanthrene (ug/l)	Pyrene (ug/l)
Industrial Vapor Intrusion Screening (CR 1X10-6)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	20	NS	NS
MW12D	04/11/00	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
	03/27/01	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
	06/05/02	< 0.16	< 0.17	< 0.11	< 0.14	< 0.12	0.67	0.76	0.96	0.61	0.63	0.68	0.16	1.9	< 0.13	0.59	< 0.16	0.55	1.5
	05/15/03	< 0.018	< 0.017	< 0.018	0.059	0.051	0.52	0.92	1.2	0.93	1.1	1.1	0.28	1.6	< 0.017	0.73	0.065	0.34	1.2
	05/24/04	< 0.34	< 0.32	< 0.34	< 0.36	< 0.38	0.95	2.2	2.9	2.6	2.1	2	0.64	3.2	< 0.32	2.2	< 0.45	0.67	2.5
	05/18/05	0.1	< 0.091	< 0.078	0.11	< 0.071	0.45	0.84	1.2	1	0.88	0.8	0.22	1.1	< 0.087	0.8	0.5	0.21	0.8
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	< 0.01	< 0.011	< 0.0082	0.016	0.014	0.086	0.19	0.24	0.24	0.2	0.16	0.047	0.21	< 0.0091	0.18	0.024	0.041	0.18
	05/16/07	0.025	0.014	0.014	0.036	0.024	0.095	0.27	0.34	0.32	0.24	0.17	0.059	0.23	< 0.0091	0.26	0.17	0.046	0.18
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/26/09	< 0.047	0.053	0.0079	0.044	0.044	0.12	0.21	0.33	0.2	0.13	0.19	0.04	0.23	< 0.0048	0.17	< 0.17	0.051	0.19
	01/26/10	0.0076	0.016	< 0.0045	0.012	0.0084	0.018	0.034	0.047	0.047	0.039	0.035	0.012	0.044	< 0.0048	0.038	0.092	0.013	0.041
	04/27/10	0.016	0.018	< 0.0045	0.0051	0.012	0.0042	0.0091	0.013	0.016	0.014	0.01	< 0.0032	0.015	< 0.0048	0.011	0.17	< 0.0081	0.011
	07/27/10	0.016	0.023	0.0075	0.0046	0.028	0.0042	0.0068	0.011	0.0098	0.0096	0.0086	< 0.0032	0.017	< 0.0048	0.0073	0.073	0.017	0.011
	11/03/10	< 0.005	0.0044	< 0.0045	0.0058	0.011	0.012	0.036	0.041	0.055	0.048	0.037	0.011	0.04	< 0.0048	0.038	0.019	0.0095	0.035
	05/17/11	< 0.005	0.0085	< 0.0045	0.0038	0.01	0.012	0.023	0.038	0.04	0.028	0.023	0.007	0.037	< 0.0048	0.028	0.019	0.012	0.031
	11/01/11	0.018	0.0071	0.0067	< 0.0036	0.0063	< 0.0036	0.0034	0.0053	0.0062	< 0.0044	0.0043	< 0.0032	0.0051	< 0.0048	< 0.0047	0.015	< 0.0081	< 0.0047
MW13	04/11/00	--	90	29	3.8	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	2	< 1	**2000**	< 1	< 5
	03/27/01	--	210	72	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	**3700**	< 5	< 5
	06/05/02	< 430	< 450	< 290	2.9	0.88	2.4	3.4	4.1	2.9	2.6	2.5	0.63	6.6	5.3	2.5	**3800**	3.7	5.8
	05/15/03	30	0.77	18	1.2	1.2	4.4	6.2	6	5.7	5	5.1	1.4	12	2.1	4.5	1.6	4.3	9.7
	05/24/04	55	24	17	2	< 0.38	1.4	2.7	2.7	2.7	1.9	1.8	0.72	3.3	2.3	2.3	**140**	1.5	2.7
	05/18/05	190	66	51	4.5	< 1.8	< 2	< 1.8	< 1.8	< 2.1	< 1.9	< 1.6	< 2.2	2	3.5	< 1.7	**920**	< 2	< 1.6
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	99	22	37	4	< 4.7	< 6.4	< 7.5	< 6.4	< 7.9	< 7.9	< 7.7	< 7.7	< 6.3	< 3.7	< 7.7	**51**	< 4.6	< 5.9
	05/16/07	0.49	0.16	1.8	0.25	0.091	0.35	0.69	0.69	0.69	0.64	0.48	0.17	0.84	0.066	0.59	0.62	0.22	0.62
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/26/09	< 472	< 472	171	< 36	< 57.4	< 36.2	< 28.6	< 34	< 48.1	< 43.7	< 34.8	< 32	< 44.1	< 47.7	< 46.8	**3540**	< 80.9	< 47.5
	01/26/10	104	15.4	32.3	1.1	0.37	< 0.073	< 0.058	0.076	< 0.097	< 0.088	< 0.07	< 0.065	< 0.089	3.1	< 0.094	< 0.95	< 0.16	< 0.096
	04/27/10	237	119	83	2.8	< 0.57	< 0.36	< 0.29	< 0.34	< 0.48	< 0.44	< 0.35	< 0.32	< 0.44	6.8	< 0.47	**1400**	< 0.81	< 0.47
	07/26/10	117	74.3	48.3	1.6	0.31	< 0.072	< 0.057	0.077	< 0.096	< 0.087	< 0.07	< 0.064	< 0.088	6.6	< 0.094	**791**	1.6	< 0.095
	11/02/10	4.7	< 0.077	3.3	0.36	0.21	< 0.072	< 0.057	< 0.068	< 0.096	< 0.087	< 0.07	< 0.064	< 0.088	0.13	< 0.094	0.17	< 0.16	< 0.095
	05/17/11	0.011	0.011	0.01	0.034	0.033	0.032	0.045	0.081	0.063	0.046	0.049	0.014	0.078	0.0055	0.049	0.033	0.03	0.071
	11/01/11	119	33.5	45.2	1.4	0.23	< 0.072	< 0.057	< 0.068	< 0.096	< 0.087	< 0.07	< 0.064	< 0.088	6.5	< 0.094	**45.1**	1.2	< 0.095
MW14	04/11/00	--	140000	3300	36000	13000	9500	8600	6700	4500	7700	8800	1200	27000	18000	4000	**540000**	45000	23000
	03/27/01	--	140000	3300	45000	13000	10000	8400	8300	3300	< 4	7400	1100	28000	15000	3800	**510000**	50000	24000

Table 4. Groundwater Screening for Vapor Intrusion Evaluation - Polynuclear Aromatic Hydrocarbons (PAHs)
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample Location	Sample Date	1-Methylnaphthalene (ug/l)	2-methylnaphthalene (ug/l)	Acenaphthene (ug/l)	Acenaphthylene (ug/l)	Anthracene (ug/l)	Benzo(a)anthracene (ug/l)	Benzo(a)pyrene (ug/l)	Benzo(b)fluoranthene (ug/l)	Benzo(ghi)perylene (ug/l)	Benzo(k)fluoranthene (ug/l)	Chrysene (ug/l)	Dibenz(a,h)anthracene (ug/l)	Fluoranthene (ug/l)	Fluorene (ug/l)	Indeno(1,2,3-cd)pyrene (ug/l)	Naphthalene (PAH) (ug/l)	Phenanthrene (ug/l)	Pyrene (ug/l)
Industrial Vapor Intrusion Screening (CR 1X10-6)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	20	NS	NS
MW17T	04/11/00	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
	03/27/01	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
	06/05/02	0.041	0.045	< 0.018	< 0.023	< 0.02	< 0.019	< 0.012	< 0.014	< 0.015	< 0.013	< 0.018	< 0.017	< 0.028	< 0.021	< 0.014	0.49	< 0.019	< 0.02
	05/15/03	< 0.02	< 0.019	< 0.02	< 0.021	0.022	< 0.013	< 0.016	< 0.015	< 0.018	< 0.021	< 0.016	< 0.018	< 0.015	< 0.019	< 0.024	< 0.027	< 0.018	< 0.019
	02/25/04	0.021	0.037	< 0.017	0.036	0.053	0.39	0.7	1	0.9	0.7	0.73	0.21	1.2	0.022	0.73	0.56	0.28	0.88
	05/24/04	< 0.017	< 0.016	< 0.017	< 0.018	< 0.019	< 0.011	< 0.013	< 0.012	< 0.015	< 0.018	< 0.013	< 0.015	< 0.012	< 0.016	< 0.02	< 0.023	< 0.015	< 0.016
	05/18/05	< 0.02	< 0.023	< 0.019	< 0.019	< 0.018	< 0.02	0.03	0.032	0.031	0.03	0.026	< 0.022	0.037	< 0.022	0.024	0.046	< 0.02	0.033
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	0.012	0.017	< 0.0082	< 0.0081	< 0.012	< 0.016	< 0.018	0.019	< 0.019	< 0.019	< 0.019	< 0.019	0.025	< 0.0091	< 0.019	0.013	0.014	0.02
	05/16/07	< 0.01	< 0.011	< 0.0082	< 0.0081	< 0.012	< 0.016	< 0.018	< 0.016	< 0.019	< 0.019	< 0.019	< 0.019	0.02	< 0.0091	< 0.019	< 0.012	< 0.011	0.016
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/26/09	< 0.047	< 0.047	< 0.0045	0.0086	0.0069	0.031	0.045	0.043	0.035	0.034	0.036	0.0075	0.053	< 0.0048	0.029	< 0.17	0.015	0.047
	01/26/10	< 0.005	0.0046	< 0.0045	0.0065	0.0094	0.054	0.11	0.11	0.11	0.097	0.074	0.023	0.056	< 0.0048	0.09	< 0.047	0.017	0.054
	04/28/10	0.074	0.07	0.013	< 0.0036	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.75	< 0.0081	< 0.0047
	07/26/10	0.013	0.0045	0.0049	0.005	< 0.0057	< 0.0036	0.0034	0.0051	< 0.0048	0.0045	0.0048	< 0.0032	0.006	< 0.0048	< 0.0047	0.018	< 0.0081	0.0052
	11/02/10	< 0.005	0.0058	< 0.0045	0.0045	0.0064	0.0078	0.016	0.018	0.018	0.02	0.017	< 0.0032	0.019	< 0.0048	0.013	0.013	< 0.0081	0.017
	05/17/11	< 0.005	0.0068	< 0.0045	0.0054	< 0.0057	0.0088	0.01	0.015	0.012	0.012	0.012	0.0035	0.017	< 0.0048	0.0094	0.026	0.0088	0.016
	11/01/11	0.015	0.015	0.0074	0.0046	0.0065	0.013	0.015	0.018	0.011	0.015	0.02	< 0.0032	0.024	< 0.0048	0.0093	0.073	0.01	0.022
MW18T	04/11/00	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
	03/27/01	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
	06/05/02	< 0.027	< 0.028	< 0.018	< 0.023	< 0.02	< 0.019	< 0.012	< 0.014	< 0.015	< 0.013	< 0.018	< 0.017	< 0.028	< 0.021	< 0.014	0.12	< 0.019	< 0.02
	05/15/03	< 0.018	< 0.017	< 0.018	< 0.019	< 0.02	< 0.012	< 0.014	< 0.013	< 0.016	< 0.019	< 0.014	< 0.016	< 0.013	< 0.017	< 0.021	0.1	< 0.016	< 0.017
	02/25/04	< 0.017	< 0.016	< 0.017	< 0.018	< 0.019	< 0.011	< 0.013	< 0.012	< 0.015	< 0.018	< 0.013	< 0.015	< 0.012	< 0.016	< 0.02	0.028	< 0.015	< 0.016
	05/24/04	< 0.017	< 0.016	< 0.017	< 0.018	< 0.019	< 0.011	< 0.013	< 0.012	< 0.015	< 0.018	< 0.013	< 0.015	0.013	< 0.016	< 0.02	< 0.023	< 0.015	< 0.016
	05/18/05	< 0.02	< 0.023	< 0.019	< 0.019	< 0.018	< 0.02	0.019	0.022	< 0.021	< 0.019	0.019	< 0.022	0.03	< 0.022	< 0.017	< 0.022	< 0.02	0.025
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	0.036	0.013	0.009	< 0.0081	< 0.012	< 0.016	< 0.018	< 0.016	< 0.019	< 0.019	< 0.019	< 0.019	< 0.015	< 0.0091	< 0.019	0.029	< 0.011	< 0.015
	05/16/07	< 0.01	< 0.011	< 0.0082	< 0.0081	< 0.012	< 0.016	< 0.018	< 0.016	< 0.019	< 0.019	< 0.019	< 0.019	< 0.015	< 0.0091	< 0.019	< 0.012	< 0.011	< 0.015
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/26/09	< 0.005	< 0.0039	< 0.0045	0.011	< 0.0057	0.0069	0.0079	0.012	0.009	0.0069	0.0099	< 0.0032	0.013	< 0.0048	0.0063	< 0.17	< 0.0081	0.012
	01/27/10	0.012	0.011	0.0077	0.019	0.0057	0.0071	0.0082	0.01	0.0086	0.0094	0.011	< 0.0032	0.029	0.0069	0.0068	0.056	0.016	0.024
	04/27/10	< 0.005	0.0054	< 0.0045	0.012	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	0.007	< 0.0048	< 0.0047	0.017	0.012	0.0048
	07/26/10	< 0.005	0.0042	< 0.0045	0.012	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.0088	< 0.0081	< 0.0047
	11/03/10	0.0075	0.0071	< 0.0045	0.012	0.0059	0.0085	0.011	0.014	0.013	0.019	0.02	< 0.0032	0.02	< 0.0048	0.0097	0.037	0.0092	0.021
	05/17/11	< 0.005	0.0086	< 0.0045	0.012	< 0.0057	0.0057	0.0058	0.0083	0.0062	0.0058	0.0078	< 0.0032	0.0098	< 0.0048	< 0.0047	0.019	< 0.0081	0.0093
	11/01/11	0.0073	0.0057	< 0.0045	0.011	< 0.0057	< 0.0036	0.0033	0.0042	< 0.0048	< 0.0044	0.0037	< 0.0032	0.0047	< 0.0048	< 0.0047	0.016	< 0.0081	< 0.0047

Table 4. Groundwater Screening for Vapor Intrusion Evaluation - Polynuclear Aromatic Hydrocarbons (PAHs)
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample Location	Sample Date	1-Methylnaphthalene (ug/l)	2-methylnaphthalene (ug/l)	Acenaphthene (ug/l)	Acenaphthylene (ug/l)	Anthracene (ug/l)	Benzo(a)anthracene (ug/l)	Benzo(a)pyrene (ug/l)	Benzo(b)fluoranthene (ug/l)	Benzo(ghi)perylene (ug/l)	Benzo(k)fluoranthene (ug/l)	Chrysene (ug/l)	Dibenz(a,h)anthracene (ug/l)	Fluoranthene (ug/l)	Fluorene (ug/l)	Indeno(1,2,3-cd)pyrene (ug/l)	Naphthalene (PAH) (ug/l)	Phenanthrene (ug/l)	Pyrene (ug/l)
Industrial Vapor Intrusion Screening (CR 1X10-6)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	20	NS	NS
MW19T	04/11/00	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
	03/27/01	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
	06/05/02	< 0.16	< 0.17	< 0.11	0.3	0.19	0.86	1.2	1.1	0.92	0.71	0.69	0.29	1.7	< 0.13	0.91	0.44	0.44	1.4
	05/15/03	< 0.018	< 0.017	< 0.018	0.031	0.022	0.092	0.16	0.17	0.15	0.12	0.12	0.038	0.19	< 0.017	0.13	0.032	0.06	0.18
	02/25/04	< 0.017	0.016	< 0.017	< 0.018	< 0.019	0.023	0.043	0.059	0.054	0.044	0.044	< 0.015	0.07	< 0.016	0.043	0.12	0.02	0.053
	05/24/04	0.019	0.026	< 0.017	0.068	0.093	0.66	1.5	2.1	1.8	1.4	1.5	0.42	2.2	0.024	1.5	0.045	0.54	1.7
	05/18/05	< 0.02	< 0.023	< 0.019	0.04	0.026	0.1	0.17	0.21	0.2	0.16	0.14	0.041	0.24	< 0.022	0.16	0.069	0.075	0.2
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	0.018	0.02	< 0.0082	0.029	0.017	0.054	0.098	0.12	0.11	0.088	0.075	0.023	0.13	< 0.0091	0.086	0.25	0.039	0.11
	05/16/07	< 0.01	0.014	< 0.0082	0.016	< 0.012	0.019	0.039	0.038	0.042	0.033	0.028	< 0.019	0.056	< 0.0091	0.029	0.034	0.024	0.046
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/26/09	< 0.047	< 0.047	0.011	0.12	0.11	0.44	0.91	1.5	0.9	0.64	0.85	0.2	1.1	0.033	0.73	< 0.17	0.25	1
	01/26/10	< 0.005	0.0062	< 0.0045	0.033	0.036	0.099	0.22	0.29	0.3	0.25	0.23	0.064	0.28	< 0.0048	0.23	< 0.047	0.064	0.27
	04/28/10	0.035	0.039	0.16	0.11	0.13	0.024	0.02	0.027	0.028	0.023	0.043	0.0053	0.21	0.14	0.019	0.36	0.2	0.2
	07/26/10	0.039	0.0046	0.017	0.014	0.0077	0.016	0.031	0.05	0.046	0.037	0.036	0.014	0.035	< 0.0048	0.037	0.014	0.011	0.032
	11/02/10	0.0078	0.012	< 0.0045	0.012	0.013	0.018	0.048	0.059	0.063	0.058	0.047	0.012	0.051	0.0051	0.044	0.027	0.012	0.053
	05/18/11	< 0.005	0.0065	< 0.0045	0.018	0.013	0.056	0.11	0.18	0.16	0.12	0.1	0.034	0.14	< 0.0048	0.12	0.019	0.032	0.14
	11/02/11	< 0.005	0.0082	< 0.0045	0.017	0.011	0.023	0.05	0.069	0.073	0.05	0.05	0.014	0.06	< 0.0048	0.055	0.017	0.016	0.061
MW20T	04/11/00	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
	03/27/01	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
	06/05/02	< 0.027	< 0.028	< 0.018	< 0.023	< 0.02	0.022	0.031	0.033	0.029	0.024	0.025	< 0.017	0.061	< 0.021	0.026	< 0.027	0.027	0.063
	05/15/03	0.053	0.035	< 0.018	< 0.019	< 0.02	< 0.012	0.018	0.025	0.023	< 0.019	0.02	< 0.016	0.032	< 0.017	< 0.021	0.33	0.018	0.028
	02/25/04	0.02	0.03	< 0.017	0.042	< 0.019	0.039	0.046	0.048	0.04	0.037	0.049	< 0.015	0.1	< 0.016	0.032	0.096	0.065	0.079
	05/24/04	< 0.017	< 0.016	< 0.017	0.019	< 0.019	0.078	0.12	0.14	0.12	0.1	0.11	0.031	0.21	< 0.016	0.1	< 0.023	0.078	0.18
	05/25/04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/18/05	< 0.02	< 0.023	< 0.019	< 0.019	< 0.018	< 0.02	0.027	0.035	0.029	0.027	0.029	< 0.022	0.046	< 0.022	0.022	0.039	0.023	0.037
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	< 0.01	0.015	< 0.0082	< 0.0081	< 0.012	0.032	0.055	0.053	0.051	0.041	0.044	< 0.019	0.084	< 0.0091	0.037	< 0.012	0.032	0.064
	05/16/07	< 0.01	< 0.011	< 0.0082	< 0.0081	< 0.012	< 0.016	< 0.018	0.023	< 0.019	0.02	0.019	< 0.019	0.037	< 0.0091	< 0.019	< 0.012	0.021	0.026
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/26/09	< 0.047	< 0.047	< 0.0045	0.016	0.015	0.074	0.13	0.17	0.12	0.095	0.11	0.03	0.17	0.0063	0.096	< 0.17	0.044	0.14
	01/26/10	< 0.005	< 0.0039	< 0.0045	0.0042	< 0.0057	0.0061	0.0057	0.0084	0.0069	0.0068	0.011	< 0.0032	0.018	< 0.0048	0.0053	< 0.047	< 0.0081	0.022
	04/28/10	0.0055	0.0071	< 0.0045	0.0042	< 0.0057	0.0051	0.0078	0.0097	0.0086	0.01	0.012	< 0.0032	0.015	< 0.0048	0.0064	0.04	< 0.0081	0.012
	07/26/10	0.0097	0.0084	< 0.0045	0.0058	< 0.0057	0.022	0.039	0.056	0.04	0.047	0.05	0.0073	0.062	< 0.0048	0.03	0.067	0.012	0.047
	11/02/10	< 0.005	0.0052	< 0.0045	< 0.0036	< 0.0057	0.0043	0.0076	0.0077	0.0077	0.011	0.0092	< 0.0032	0.0082	< 0.0048	0.0052	0.0085	< 0.0081	0.0074
	05/18/11	0.006	0.01	< 0.0045	0.0046	< 0.0057	0.0054	0.0083	0.014	0.011	0.0084	0.0081	0.0036	0.012	< 0.0048	0.0079	0.024	< 0.0081	0.0096
	11/01/11	< 0.005	0.0054	< 0.0045	0.0047	< 0.0057	0.0056	0.0036	0.0064	< 0.0048	0.0058	0.0061	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.016	< 0.0081	< 0.0047

Table 4. Groundwater Screening for Vapor Intrusion Evaluation - Polynuclear Aromatic Hydrocarbons (PAHs)
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample Location	Sample Date	1-Methylnaphthalene (ug/l)	2-methylnaphthalene (ug/l)	Acenaphthene (ug/l)	Acenaphthylene (ug/l)	Anthracene (ug/l)	Benzo(a)anthracene (ug/l)	Benzo(a)pyrene (ug/l)	Benzo(b)fluoranthene (ug/l)	Benzo(ghi)perylene (ug/l)	Benzo(k)fluoranthene (ug/l)	Chrysene (ug/l)	Dibenz(a,h)anthracene (ug/l)	Fluoranthene (ug/l)	Fluorene (ug/l)	Indeno(1,2,3-cd)pyrene (ug/l)	Naphthalene (PAH) (ug/l)	Phenanthrene (ug/l)	Pyrene (ug/l)
Industrial Vapor Intrusion Screening (CR 1X10-6)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	20	NS	NS
MW21T	04/11/00	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
	03/27/01	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
	06/05/02	0.058	< 0.028	0.36	1.8	< 0.02	0.027	0.1	0.073	0.15	< 0.047	0.02	0.037	0.031	0.18	0.12	0.042	0.035	0.034
	05/15/03	0.037	0.027	0.082	0.47	< 0.02	0.021	0.072	0.066	0.11	0.046	0.03	0.02	0.046	0.037	0.081	0.18	0.022	0.042
	02/25/04	0.032	0.031	0.25	1.1	< 0.019	0.024	0.055	0.053	0.068	0.047	0.037	< 0.015	0.059	0.081	0.052	0.76	0.034	0.05
	05/24/04	0.018	0.022	0.025	0.066	0.053	0.37	0.58	0.72	0.63	0.59	0.6	0.17	1	0.026	0.54	0.038	0.35	0.82
	05/18/05	0.03	< 0.023	0.18	0.75	< 0.018	0.049	0.11	0.12	0.15	0.11	0.092	0.031	0.15	0.068	0.11	0.049	0.059	0.11
	11/28/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/06	< 0.026	< 0.029	< 0.021	0.097	0.039	0.14	0.32	0.56	0.44	0.35	0.38	0.078	0.51	< 0.023	0.34	< 0.032	0.14	0.41
	05/16/07	0.01	0.013	0.011	0.1	0.016	0.053	0.13	0.21	0.18	0.14	0.13	0.027	0.18	0.012	0.16	0.013	0.054	0.15
	11/15/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/26/09	< 0.02	< 0.19	0.019	0.19	0.043	0.18	0.41	0.73	0.47	0.46	0.53	0.088	0.7	0.023	0.4	< 0.17	0.15	0.55
	01/27/10	0.026	0.018	0.023	0.061	0.034	0.048	0.1	0.17	0.15	0.15	0.15	0.032	0.23	0.014	0.12	0.11	0.066	0.19
	04/27/10	0.017	0.0086	0.012	0.11	0.037	0.12	0.26	0.53	0.36	0.33	0.36	0.075	0.57	0.02	0.28	0.035	0.2	0.46
	07/26/10	0.019	0.0065	0.031	0.48	0.014	0.0075	0.016	0.03	0.021	0.021	0.023	0.0045	0.038	0.026	0.016	0.028	0.015	0.031
	11/03/10	0.0056	0.0053	0.016	0.12	0.014	0.014	0.033	0.063	0.056	0.046	0.055	0.01	0.072	0.01	0.04	0.022	0.018	0.066
	05/18/11	0.0067	0.01	0.0049	0.017	0.013	0.034	0.061	0.12	0.087	0.086	0.085	0.02	0.11	< 0.0048	0.069	0.028	0.036	0.11
	11/02/11	0.014	0.013	0.034	0.59	0.025	0.046	0.093	0.15	0.13	0.12	0.13	0.027	0.17	0.049	0.096	0.041	0.07	0.17
PZ07B	10/26/09	< 0.047	< 0.047	0.035	0.15	0.027	0.048	0.09	0.13	0.095	0.089	0.08	0.018	0.1	0.0086	0.078	< 0.17	0.03	0.089
	01/27/10	0.006	0.0089	0.0061	< 0.0036	0.0075	0.01	0.011	0.018	0.016	0.015	0.015	< 0.0032	0.015	< 0.0048	0.012	< 0.047	< 0.0081	0.017
	04/27/10	< 0.005	0.0058	< 0.0045	0.036	0.072	0.15	0.21	0.29	0.21	0.21	0.23	0.042	0.42	0.0067	0.17	0.011	0.073	0.35
	07/26/10	0.025	0.029	0.035	0.045	0.043	0.035	0.073	0.14	0.12	0.097	0.098	0.023	0.13	0.023	0.085	0.085	0.055	0.11
	11/02/10	0.025	0.012	0.018	0.058	0.019	0.0051	0.0053	0.0093	0.007	0.0092	0.01	< 0.0032	0.028	0.0092	< 0.0047	0.035	0.022	0.021
	05/17/11	0.033	0.016	0.015	0.07	0.019	0.025	0.035	0.07	0.044	0.039	0.044	0.011	0.079	0.0075	0.033	0.036	0.028	0.063
	11/01/11	0.026	0.017	0.022	0.064	0.018	0.014	0.026	0.041	0.033	0.03	0.029	0.0073	0.03	0.013	0.026	0.05	0.015	0.027
PZ18TB	10/26/09	< 0.047	< 0.047	0.041	0.018	0.025	0.032	0.03	0.035	0.026	0.03	0.037	0.0086	0.1	0.031	0.022	< 0.17	0.043	0.095
	01/27/10	0.015	0.016	0.019	0.0057	< 0.0057	0.0057	0.0087	0.011	0.01	0.01	0.0097	< 0.0032	0.025	0.013	0.0086	0.099	0.02	0.021
	04/27/10	< 0.0051	0.0072	0.0071	0.0041	< 0.0058	0.0037	0.0051	0.0064	0.0055	0.0055	0.0059	< 0.0033	0.013	0.0078	< 0.0048	0.017	0.016	0.014
	07/26/10	< 0.005	0.0065	< 0.0045	< 0.0036	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.0093	< 0.0081	< 0.0047
	11/03/10	0.05	0.014	0.0092	< 0.0036	< 0.0057	0.0046	0.0042	0.005	< 0.0048	0.0062	0.0076	< 0.0032	0.015	0.0074	< 0.0047	0.059	0.014	0.013
	05/17/11	0.016	0.018	0.018	< 0.0036	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	0.0042	< 0.0032	0.014	0.011	< 0.0047	0.023	0.025	0.012
	11/01/11	< 0.005	< 0.0039	< 0.0045	< 0.0036	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.0098	< 0.0081	< 0.0047
PZ23B	10/27/09	< 0.047	< 0.047	0.0077	0.0099	< 0.0057	0.025	0.044	0.059	0.044	0.037	0.043	0.012	0.059	0.005	0.036	0.15	0.017	0.046
	01/26/10	< 0.005	0.0068	0.005	< 0.0036	0.0073	0.02	0.031	0.042	0.04	0.042	0.036	0.012	0.045	< 0.0048	0.033	< 0.047	0.012	0.039
	04/28/10	< 0.005	0.0057	< 0.0046	< 0.0036	< 0.0058	0.0056	0.012	0.018	0.018	0.017	0.013	0.0035	0.019	< 0.0048	0.013	0.015	0.0083	0.015
	07/27/10	0.01	0.016	0.0061	0.0068	< 0.0057	0.0092	0.021	0.041	0.031	0.028	0.03	0.0051	0.034	0.0049	0.022	0.047	0.013	0.029
	11/03/10	0.03	0.013	0.011	0.006	< 0.0057	0.0072	0.021	0.029	0.026	0.032	0.027	0.0052	0.028	< 0.0048	0.018	0.033	0.011	0.025
	05/18/11	< 0.005	0.009	0.0048	0.0071	0.0058	0.022	0.051	0.098	0.083	0.076	0.058	0.017	0.067	< 0.0048	0.063	0.017	0.014	0.054
	11/02/11	< 0.005	0.0055	0.0068	0.0068	< 0.0057	0.0044	0.0095	0.018	0.014	0.011	0.013	< 0.0032	0.013	< 0.0048	0.011	0.015	< 0.0081	0.011
PZ24	10/27/09	0.68	1	0.74	0.97	1.3	0.78	0.85	0.83	0.55	0.49	0.76	0.14	2	0.97	0.46	7.7	3.1	1.7
	01/26/10	0.21	0.35	0.25	0.24	0.21	0.054	0.03	0.034	0.028	0.028	0.055	0.0064	0.34	0.26	0.022	2.5	0.59	0.3
	04/28/10	0.0061	0.0079	< 0.0045	< 0.0036	< 0.0057	0.0039	0.01	0.014	0.012	0.013	0.014	< 0.0032	0.022	< 0.0048	0.0083	0.074	0.012	0.016
	07/27/10	0.016	0.015	0.013	0.016	0.028	0.011	0.0066	0.011	0.0084	0.0091	0.015	< 0.0032	0.064	0.026	0.0058	0.12	0.047	0.055
	11/03/10	0.0095	0.0095	0.0073	0.0093	0.037	0.015	0.012	0.013	0.014	0.02	0.029	0.0047	0.088	0.026	0.011	0.049	0.044	0.078
	05/18/11	< 0.005	0.0065	< 0.0045	< 0.0036	0.019	0.018	0.021	0.029	0.032	0.022	0.023	0.0076	0.085	0.019	0.023	0.018	0.014	0.076
	11/02/11	< 0.005	0.0049	0.0071	0.0063	0.014	0.0087	0.0058	0.008	0.009	0.0068	0.013	< 0.0032	0.048	0.017	0.006	0.017	< 0.0081	0.045

Table 4. Groundwater Screening for Vapor Intrusion Evaluation - Polynuclear Aromatic Hydrocarbons (PAHs)
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample Location	Sample Date	1-Methylnaphthalene (ug/l)	2-methylnaphthalene (ug/l)	Acenaphthene (ug/l)	Acenaphthylene (ug/l)	Anthracene (ug/l)	Benzo(a)anthracene (ug/l)	Benzo(a)pyrene (ug/l)	Benzo(b)fluoranthene (ug/l)	Benzo(ghi)perylene (ug/l)	Benzo(k)fluoranthene (ug/l)	Chrysene (ug/l)	Dibenz(a,h)anthracene (ug/l)	Fluoranthene (ug/l)	Fluorene (ug/l)	Indeno(1,2,3-cd)pyrene (ug/l)	Naphthalene (PAH) (ug/l)	Phenanthrene (ug/l)	Pyrene (ug/l)
Industrial Vapor Intrusion Screening (CR 1X10-6)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	20	NS	NS
PZ25	10/27/09	132	185	138	55.9	25.5	8.8	3.9	4.3	< 4.8	< 4.4	6	0.48	39.3	87.6	< 4.7	**1570**	120	28.1
	01/27/10	< 0.1	< 0.077	6.3	4.4	1.1	0.26	0.089	0.1	< 0.096	< 0.087	0.21	< 0.064	7.3	< 0.095	< 0.094	< 0.94	< 0.16	4.7
	04/28/10	0.057	< 0.039	1.6	0.7	0.58	0.21	0.23	0.29	0.068	0.23	0.29	< 0.032	2.8	0.092	0.058	0.14	< 0.081	4.8
	07/27/10	16.2	13.1	14.1	17.5	7.4	0.36	0.066	0.062	0.022	0.083	0.2	0.0042	5.6	15.3	0.018	**131**	26.1	4.3
	11/03/10	7	1.4	7.1	6.5	3	0.59	0.35	0.28	0.16	0.38	0.56	< 0.064	4	6.2	0.12	**43.1**	10.4	3
	05/18/11	0.012	0.0092	0.0084	0.13	0.14	0.14	0.19	0.25	0.1	0.12	0.17	0.03	0.2	0.018	0.088	0.026	0.088	0.16
	11/02/11	1	< 0.0039	12.2	10.2	0.85	0.3	0.1	0.11	0.032	0.087	0.2	0.01	5.3	4.8	0.028	1.3	0.058	3.9
PZ26	10/27/09	< 0.047	< 0.047	0.48	0.37	0.014	0.0063	0.0037	0.005	< 0.0048	< 0.0044	0.0065	< 0.0032	0.028	0.051	< 0.0047	0.67	0.044	0.023
	01/27/10	0.17	0.21	0.38	0.099	0.067	0.029	0.043	0.054	0.047	0.05	0.051	0.0098	0.088	0.22	0.038	1.4	0.28	0.084
	04/28/10	0.024	0.028	0.23	0.08	0.011	0.037	0.1	0.19	0.16	0.13	0.13	0.029	0.18	0.012	0.12	0.44	0.019	0.15
	07/27/10	0.009	0.0043	0.27	0.17	0.01	0.019	0.049	0.087	0.07	0.063	0.059	0.013	0.056	0.021	0.05	0.027	0.015	0.044
	11/03/10	0.021	0.011	0.24	0.16	0.029	0.06	0.16	0.27	0.22	0.2	0.18	0.045	0.21	0.019	0.16	0.12	0.053	0.18
	05/18/11	0.013	0.015	0.27	0.18	0.0091	0.024	0.079	0.11	0.12	0.13	0.092	0.024	0.12	0.024	0.082	0.037	0.021	0.089
	11/02/11	< 0.005	0.007	0.0058	0.011	0.013	0.031	0.083	0.14	0.13	0.1	0.094	0.027	0.093	< 0.0048	0.095	0.019	0.015	0.083

NOTES:

< 2.0: Parameter not detected above the limit of detection indicated.
--: Analysis not performed.
NS: No screening level exists for this pararmeter.
Concentrations exceeding the screening level are **BOLD.**

Table 5. Groundwater Elevation Summary

Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 N. Tenth Street, Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Well Data	MW-1		MW-2		MW-5		PZ-5 (To Be Installed)	
Well Depth from TOC (feet)	23.71		23.75		29.2			
Screen Length (feet)	3		3		3			
Surface Elevation (MSL)[A]	na		na		na			
Top of Casing Elevation (MSL)[A]	601.06		597.18		605.24			
Top of Screen Elevation (MSL)	580.35		576.43		579.04		0.00	
Bottom of Screen Elevation (MSL)	577.35		573.43		576.04		0.00	
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**
3/22/1999	19.53	581.53 *	15.57	581.61 *	23.48	581.76 *		
4/10/2000	Dry	< 577.35	16.61	580.57 *	24.51	580.73 *		
3/26/2001	20.65	580.41 *	16.56	580.62 *	24.63	580.61 *		
10/25/2001	19.89	581.17 *	15.95	581.23 *	23.86	581.38 *		
1/31/2002	inaccessible due to snow/ice		16.23	580.95 *	24.15	581.09 *		
3/3/2002	19.45	581.61 *	inaccessible due to snow/ice		inaccessible due to snow/ice			
6/5/2002	19.32	581.74 *	15.39	581.79 *	23.33	581.91 *		
5/15/2003	dry	dry	16.35	580.83 *	24.31	580.93 *		
8/26/2003	dry	dry	16.34	580.84 *	24.29	580.95 *		
11/19/2003	20.62	580.44 *	16.74	580.44 *	24.86	580.38 *		
2/25/2004	20.67	580.39 *	16.81	580.37 *	24.76	580.48 *		
5/24/2004	~23.7	~577.4	15.64	581.54 *	23.70	581.54 *		
11/10/2004	19.29	581.77 *	15.36	581.82 *	23.31	581.93 *		
5/18/2005	19.32 G	581.74 *	15.43	581.75 *	22.98 G	582.26 *		
11/28/2005	20.04	581.02 *	16.13	581.05 *	24.12	581.12 *		
5/30/2006	19.68	581.38 *	15.75	581.43 *	23.75	581.49 *		
11/14/2006	19.91	581.15 *	15.93	581.25 *	25.40	579.84 *		
5/16/2007	19.42	TBS	15.59	581.59 *	23.62	581.62 *		
10/26/2009	19.3	581.76 *	14.53	582.65 *	23.65	581.59 *		
1/27/2010	nm	nm	15.24	581.94 *	23.58	581.66 *		
4/27/2010	21.8	579.26	15.2	581.98 *	23.50	581.74 *		
7/26/2010	18.43	582.63 *	14.72	582.46 *	22.78	582.46 *		
11/2/2010	19.26	581.80 *	15.41	581.77 *	23.51	581.73 *		
5/17/2011	18.85	582.21 *	14.95	582.23 *	23.13	582.11 *		
11/1/2011	18.7	582.36 *	14.79	582.39 *	22.95	582.29 *		

Table 5. Groundwater Elevation Summary

Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 N. Tenth Street, Manitowoc, Wisconsin
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Well Data	MW-6		MW-7		PZ-7B		MW-8	
Well Depth from TOC (feet)	30.55		10.63		63.46		10.53	
Screen Length (feet)	10		5		5		5	
Surface Elevation (MSL)[A]	na		na		589.30		na	
Top of Casing Elevation (MSL)[A]	601.85		588.93		588.76		588.13	
Top of Screen Elevation (MSL)	581.30		583.30		530.3		582.60	
Bottom of Screen Elevation (MSL)	571.30		578.30		525.3		577.60	
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**
03/22/1999	20.18	581.67 *	7.30	581.63			6.58	581.55
04/10/2000	21.23	580.62	8.32	580.61			7.59	580.54
03/26/2001	21.34	580.51	8.43	580.50			7.70	580.43
10/25/2001	20.56	581.29	7.66	581.27			6.94	581.19
01/31/2002	inaccessible due to snow/ice		nm	nm			nm	nm
03/03/2002	inaccessible due to snow/ice		7.94	580.99			inaccessible due to snow/ice	
06/05/2002	20.03	581.82 *	7.14	581.79			6.75	581.38
05/15/2003	20.91	580.94	8.10	580.83			7.35	580.78
08/26/2003	20.98	580.87	8.07	580.86			7.32	580.81
11/19/2003	21.39	580.46	8.18	580.75			7.70	580.43
02/25/2004	21.43	580.42	8.52	580.41			inaccessible due to snow/ice	
05/24/2004	20.25	581.60 *	7.36	581.57			6.72	581.41
11/10/2004	19.9	581.95 *	7.08	581.85			5.16	582.97 *
05/18/2005	20.06	581.79 *	7.19	581.74			6.46	581.67
11/28/2005	20.83	581.02	7.88	581.05			7.03	581.10
05/30/2006	20.33	581.52 *	7.47	581.46			7.72	580.41
11/14/2006	20.61	581.24	7.73	581.20			7.03	581.10
05/16/2007	20.22	581.63 *	7.36	581.57	Added 09/2009		7.10	581.03
10/26/2009	19.4	582.45 *	6.3	582.63	6.43	582.33 *	5.93	582.20
1/27/2010	19.84	582.01 *	6.91	582.02	6.98	581.78 *	6.43	581.70
4/27/2010	19.85	582.00 *	6.85	582.08	6.38	582.38 *	6.38	581.75
7/26/2010	19.20	582.65 *	6.28	582.65	6.28	582.48 *	5.94	582.19
11/2/2010	19.98	581.87 *	6.99	581.94	7.11	581.65 *	6.36	581.77
5/17/2011	19.58	582.27 *	6.63	582.30	6.67	582.09 *	7.00	581.13
11/1/2011	19.29	582.56 *	6.32	582.61	6.47	582.29 *	6.06	582.07

Table 5. Groundwater Elevation Summary

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Well Data	MW-9		MW-10		MW-12		MW-12D	
Well Depth from TOC (feet)	10.60		14.51		13.60		35.02	
Screen Length (feet)	5		5		5		15	
Surface Elevation (MSL)[A]	na		na		na		na	
Top of Casing Elevation (MSL)[A]	588.60		588.81		590.40		590.62	
Top of Screen Elevation (MSL)	583.00		579.30		581.80		570.60	
Bottom of Screen Elevation (MSL)	578.00		574.30		576.80		555.60	
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**
03/22/1999	6.99	581.61	7.22	581.59 *	10.35	580.05	10.81	579.81 *
04/10/2000	8.04	580.56	8.27	580.54 *	11.43	578.97	11.82	578.80 *
03/26/2001	8.14	580.46	8.39	580.42 *	11.72	578.68	12.10	578.52 *
10/25/2001	7.36	581.24	7.66	581.15 *	10.63	579.77	10.94	579.68 *
01/31/2002	7.65	580.95	7.87	580.94 *	10.51	579.89	10.79	579.83 *
02/15/2002	nm	nm	7.94	580.87 *	9.87	580.53	10.10	580.52 *
02/15/2002	nm	nm	7.97	580.84 *	11.25	579.15	11.89	578.73 *
02/15/2002	nm	nm	7.97	580.84 *	10.91	579.49	11.40	579.22 *
03/03/2002	7.66	580.94	7.89	580.92 *	10.20	580.20	10.43	580.19 *
06/05/2002	6.91	581.69	7.09	581.72 *	8.80	581.60	9.06	581.56 *
05/15/2003	7.83	580.77	7.95	580.86 *	inaccessible (covered with asphalt)		11.26	579.36 *
08/26/2003	7.84	580.76	7.96	580.85 *	10.10	580.30	10.38	580.24 *
11/19/2003	8.46	580.14	8.37	580.44 *	11.31	579.09	11.66	578.96 *
02/25/2004	8.22	580.38	8.50	580.31 *	11.51	578.89	inaccessible, well under melt water	
05/24/2004	7.10	581.50	7.31	581.50 *	9.42	580.98	9.81	580.81 *
11/10/2004	6.87	581.73	6.95	581.86 *	9.00	581.40	9.35	581.27 *
05/18/2005	6.92	581.68	7.07	581.74 *	10.39	580.01	10.74	579.88 *
11/28/2005	7.61	580.99	7.68	581.13 *	10.1	580.30	10.55	580.07 *
05/30/2006	7.25	581.35	7.31	581.50 *	nm	nm	9.23	581.39 *
6/20/2006	nm	nm	nm	nm *	9.85	580.55	nm	nm
11/14/2006	7.47	581.13	7.51	581.30 *	9.46	580.94	9.61	581.01 *
05/16/2007	7.08	581.52	7.19	581.62 *	10.28	580.12	11.60	579.02 *
10/26/2009	6.57	582.03	6.38	582.43 *	9.01	581.39	8.14	582.48 *
1/27/2010	6.66	581.94	6.93	581.88 *	9.55	580.85	9.76	580.86 *
4/27/2010	6.62	581.98	6.75	582.06 *	9.35	581.05	9.62	581.00 *
7/26/2010	6.02	582.58	6.23	582.58 *	8.53	581.87 *	8.87	581.75 *
11/2/2010	6.74	581.86	7.01	581.80 *	10.05	580.35	10.33	580.29 *
5/17/2011	6.38	582.22	6.95	581.86 *	9.46	580.94	9.75	580.87 *
11/1/2011	6.28	582.32	6.41	582.40 *	8.50	581.90 *	8.58	582.04 *

Table 5. Groundwater Elevation Summary

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Well Data	MW-13		MW-14		MW-15T		MW-16T	
Well Depth from TOC (feet)	12.53		17.57		20.0		17.5	
Screen Length (feet)	5		5		15		15	
Surface Elevation (MSL)[A]	na		na		na		na	
Top of Casing Elevation (MSL)[A]	590.93		594.87		586.75		586.74	
Top of Screen Elevation (MSL)	583.40		582.30		581.75		584.24	
Bottom of Screen Elevation (MSL)	578.40		577.30		566.75		569.24	
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**
03/22/1999	10.48	580.45	13.69	581.18				
04/10/2000	11.60	579.33	14.74	580.13				
03/26/2001	11.84	579.09	14.87	580.00				
10/25/2001	10.85	580.08	14.06	580.81				
01/31/2002	10.85	580.08	14.26 P	580.61				
02/15/2002	10.33	580.60	14.08 P	580.79				
02/15/2002	10.99	579.94	14.26 P	580.61				
02/15/2002	10.93	580.00	14.29 P	580.58				
03/03/2002	10.70	580.23	14.19 P	580.68				
06/05/2002	9.39	581.54	nm, P	nm				
05/15/2003	10.96	579.97	14.50 P	580.37				
08/26/2003	10.66	580.27	nm P	nm				
11/19/2003	> 8.53	na	15.32 P	579.55	nm	nm	6.89	579.85
02/25/2004	>8.53	na	14.83 P	580.04	nm	nm	7.48	579.26
05/24/2004	9.74	581.19	13.10 P	581.77	nm	nm	4.26	582.48
11/10/2004	9.60	581.33	nm	nm	nm	nm	5.93	580.81
05/18/2005	10.51	580.42	nm, P	nm	6.73	580.02	6.16	580.58
11/28/2005	10.46	580.47	14.04 P	580.83	7.02	579.73	6.08	580.66
05/30/2006	9.53	581.40	13.45 P2	581.42	6.17	580.58	nm	nm
11/14/2006	9.86	581.07	13.50 P	581.37	6.85	579.90	5.93	580.81
05/16/2007	11.45	579.48	13.80 P	581.07	6.57	580.18	5.88	580.86
10/26/2009	9.22	581.71	nm, P	nm	5.45	581.30	4.63	582.11
1/27/2010	10.00	580.93	14.02 P2	580.85	6.35	580.40	5.52	581.22
4/27/2010	9.72	581.21	13.25 P2	581.62	5.78	580.97	4.90	581.84
7/26/2010	9.23	581.70	12.60 P2	582.27	5.38	581.37	4.55	582.19
11/2/2010	10.44	580.49	nm, P2	nm	7.07	579.68	6.36	580.38
5/17/2011	9.77	581.16	12.75 P2	582.12	6.30	580.45	5.61	581.13
11/1/2011	9.14	581.79	12.50 P2	582.37 *	6.54	580.21	5.64	581.10

Table 5. Groundwater Elevation Summary

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Well Data	MW-17T		MW-18T		PZ-18TB		MW-19T	
Well Depth from TOC (feet)	23.96		26.56		74.59		40.00	
Screen Length (feet)	15		15		5		15	
Surface Elevation (MSL)[A]	na		na		598.30		na	
Top of Casing Elevation (MSL)[A]	594.81		597.85		597.89		594.50	
Top of Screen Elevation (MSL)	585.85		586.29		528.30		569.50	
Bottom of Screen Elevation (MSL)	570.85		571.29		523.30		554.50	
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**
03/22/1999	14.09	580.72	16.28	581.57			13.90	580.60 *
04/10/2000	15.24	579.57	17.30	580.55			15.03	579.47 *
03/26/2001	na	na	17.44	580.41			15.22	579.28 *
10/25/2001	14.54	580.27	16.66	581.19			14.28	580.22 *
01/31/2002	14.65	580.16	nm	nm *			inaccessible due to snow/ice	
02/15/2002	14.29	580.52	nm	nm *			13.91	580.59 *
02/15/2002	14.91	579.90	nm	nm *			14.74	579.76 *
02/15/2002	14.81	580.00	nm	nm *			14.58	579.92 *
03/03/2002	inaccessible due to snow/ice		16.92	580.93			14.14	580.36 *
06/05/2002	13.14	581.67	16.08	581.77			12.79	581.71 *
05/15/2003	14.74	580.07	16.96	580.89			14.46	580.04 *
08/26/2003	14.54	580.27	17.05	580.80			14.11	580.39 *
11/19/2003	15.27	579.54	17.47	580.38			14.95	579.55 *
02/25/2004	15.40	579.41	17.98	579.87			14.98	579.52 *
05/24/2004	13.48	581.33	16.34	581.51			12.23	582.27 *
11/10/2004	13.49	581.32	16.13	581.72			nm	nm
05/18/2005	14.23	580.58	16.20	581.65			13.90	580.60 *
11/28/2005	14.35	580.46	16.88	580.97			14.35	580.15 *
05/30/2006	13.54	581.27	16.50	581.35			13.06	581.44 *
11/14/2006	13.91	580.90	16.69	581.16			13.43	581.07 *
05/16/2007	14.20	580.61	16.36	581.49	Added 09/2009		13.83	580.67 *
10/26/2009	12.97	581.84	15.35	582.50	15.45	582.44 *	26.20	568.30
1/27/2010	13.55	581.26	15.86	581.99	16.03	581.86 *	13.28	581.22 *
4/27/2010	13.43	581.38	15.80	582.05	16.02	581.87 *	13.17	581.33 *
7/26/2010	12.73	582.08	15.20	582.65	15.44	582.45 *	12.42	582.08 *
11/2/2010	14.14	580.67	16.02	581.83	16.17	581.72 *	13.88	580.62 *
5/17/2011	13.48	581.33	15.60	582.25	16.32	581.57 *	12.80	581.70 *
11/1/2011	12.98	581.83	15.48	582.37	17.92	579.97 *	12.60	581.90 *

Table 5. Groundwater Elevation Summary

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Well Data	MW-20T		MW-21T		MW-22 (To Be Installed)	
Well Depth from TOC (feet)	39.72		40.00			
Screen Length (feet)	15		15			
Surface Elevation (MSL)[A]	na		na			
Top of Casing Elevation (MSL)[A]	596.13		596.99			
Top of Screen Elevation (MSL)	571.41		571.99		0.00	
Bottom of Screen Elevation (MSL)	556.41		556.99		0.00	
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**
03/22/1999	14.73	581.40 *	15.44	581.55 *		
04/10/2000	15.74	580.39 *	16.48	580.51 *		
03/26/2001	15.95	580.18 *	16.57	580.42 *		
10/25/2001	15.10	581.03 *	15.84	581.15 *		
01/31/2002	nm	nm	nm	nm		
01/31/2002	nm	nm	16.10	580.89 *		
02/15/2002	nm	nm	nm	nm		
02/15/2002	nm	nm	nm	nm		
02/15/2002	nm	nm	nm	nm		
03/03/2002	15.32	580.81 *	16.08	580.91 *		
06/05/2002	14.39	581.74 *	15.25	581.74 *		
05/15/2003	15.47	580.66 *	16.22	580.77 *		
08/26/2003	15.49	580.64 *	16.26	580.73 *		
11/19/2003	15.84	580.29 *	16.57	580.42 *		
02/25/2004	15.95	580.18 *	16.68	580.31 *		
05/24/2004	14.63	581.50 *	15.50	581.49 *		
11/10/2004	14.48	581.65 *	15.21	581.78 *		
05/18/2005	14.58	581.55 *	15.31	581.68 *		
11/28/2005	15.20	580.93 *	13.93	583.06 *		
05/30/2006	20.73	575.40 *	15.60	581.39 *		
11/14/2006	14.95	581.18 *	24.75	572.24 *		
05/16/2007	14.68	581.45 *	24.80/15.33	572.19/581.66 #		
10/26/2009	13.86	582.27 *	25.55	571.44		
1/27/2010	14.28	581.85 *	14.98	582.01 *		
4/27/2010	24.70	571.43 *	14.70	582.29 *		
7/26/2010	13.65	582.48 *	14.41	582.58 *		
11/2/2010	14.54	581.59 *	24.63/15.20	572.36/581.79 #		
5/17/2011	14.02	582.11 *	14.80	582.19 *		
11/1/2011	13.58	582.55 *	24.18	572.81 *		

Table 5. Groundwater Elevation Summary

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Well Data	PZ-23B		PZ-24		PZ-25		PZ-26	
Well Depth from TOC (feet)	66.04		44.17		39.58		39.54	
Screen Length (feet)	5		5		5		5	
Surface Elevation (MSL)[A]	588.60		587.40		587.50		587.30	
Top of Casing Elevation (MSL)[A]	588.14		587.07		587.08		586.84	
Top of Screen Elevation (MSL)	527.1		547.9		552.5		552.3	
Bottom of Screen Elevation (MSL)	522.1		542.9		547.5		547.3	
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**
	Added 09/2009		Added 09/2009		Added 09/2009		Added 09/2009	
10/26/2009	5.85	582.29 *	5.8	581.27 *	5.69	581.39 *	4.92	581.92 *
1/27/2010	6.29	581.85 *	6.36	580.71 *	6.22	580.86 *	5.61	581.23 *
4/27/2010	6.3	581.84 *	6.3	580.77 *	6.10	580.98 *	5.40	581.44 *
7/26/2010	5.6	582.54 *	5.65	581.42 *	5.50	581.58 *	4.80	582.04 *
11/2/2010	14.9	573.24 *	6.75	580.32 *	6.52	580.56 *	5.61	581.23 *
5/17/2011	6.10	582.04 *	5.95	581.12 *	5.80	581.28 *	5.18	581.66 *
11/1/2011	5.90	582.24 *	5.90	581.17 *	5.68	581.40 *	4.97	581.87 *

Table 5. Groundwater Elevation Summary

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Well Data	PW-1	
Well Depth from TOC (feet)	35.00	
Screen Length (feet)	15	
Surface Elevation (MSL)[A]	na	
Top of Casing Elevation (MSL)[A]	590.4	
Top of Screen Elevation (MSL)	570.4	
Bottom of Screen Elevation (MSL)	555.4	
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**
04/13/1998	15.05	575.35 *
03/22/1999	15.00	575.40 *
04/10/2000	16.76	573.64 *
03/26/2001	19.38	571.02 *
10/25/2001	16.41	573.99 *
01/31/2002	10.21	580.19 *
01/31/2002	14.05	576.35 *
02/15/2002	9.90	580.50 *
02/15/2002	26.93	563.47
02/15/2002	19.52	570.88 *
03/03/2002	10.19	580.21 *
06/05/2002	18.52	571.88 *
05/15/2003	inaccessible (covered with asphalt)	
08/26/2003	inaccessible (covered with asphalt)	
11/19/2003	18.25	572.15 *
02/25/2004	20.81	569.59
05/24/2004	16.25	574.15 *
11/10/2004	nm	nm
05/18/2005	nm	nm
11/28/2005	13.54	576.86 *
05/30/2006	9.04	581.36 *
06/20/2006	nm	nm
11/14/2006	9.50	580.90 *
05/16/2007	16.32	574.08 *
10/26/2009	16.7	573.70 *
1/27/2010	16.55	573.85 *
4/27/2010	17.60	572.80 *
7/26/2010	15.00	575.40 *
11/2/2010	18.86	571.54 *
5/17/2011	19.80	570.60 *
11/1/2011	8.64	581.76 *

RIVER STAFF GUAGE		
Top of Guage Elevation (MSL) 4/13/1998	585.88	
Top of Gauge Elevation (MSL) 5/24/2005	585.33	
	Depth to Water from TOG (feet)	**Water Elevation (MSL)**
04/13/1998	4.70	581.18
03/22/1999	7.28	578.60
04/10/2000	8.41	577.47
03/26/2001	8.35 D	577.53
10/25/2001	nm	nm
01/31/2002	nm	nm
01/31/2002	nm	nm
02/15/2002	nm	nm
02/15/2002	nm	nm
02/15/2002	nm	nm
03/03/2002	nm	nm
06/05/2002	nm	nm
05/15/2003	nm	nm
08/26/2003	nm	nm
11/19/2003	nm	nm
02/25/2004	nm	nm
05/24/2004	nm	nm
11/10/2004	nm	nm
05/24/2005	6.72	578.61
11/28/2005	7.34	577.99
05/30/2006	6.83	578.50
06/20/2006	7.19	578.14
11/14/2006	7.40	577.93
05/16/2007	7.05	578.28
10/26/2009	6.29	579.04
1/27/2010	6.44	578.89
4/27/2010	6.85	578.48
7/26/2010	6.35	578.98
11/2/2010	7.22	578.11
5/17/2011	6.90	578.43
11/1/2011	8.05	577.28

Notes:

O CJM 01/05/2012, C AMM 01/10/2012, JAZ 1/17/2012

1) Well construction and pre-2002 water level data collected from Horizon Environmental reports.

2) Date given represents the first date of a multiple day sampling event.

D: River was covered with 6-12 inches of ice.

G: Bailer had to be removed to obtain water level

P: Product (DNAPL) present in well.

P2: Apparent LNAPL and/or DNAPL product (approx. 0.05 ft to to not measureable) present in well.

TOC: top of well casing

TOG: top of staff gauge

***:** Water elevation above top of screen.

MSL: mean sea level

na: not available

nm: not measured

TBS: To be surveyed in June 2007 bases on new top of casing elevation

#: Initial and final depth to water are provided as evidence of a large change in groundwater level observed during sampling; cause currently being evaluated.

Table 6. Proposed Soil Vapor Sampling Locations and Depths

Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street, Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample ID and location	Sub Slab Depth	Shallow Sample Depth (5 ft or less)	Deep Sample Depth (> 5 ft)	Total No. of Samples	Rationale
SV101 – North side interior of Main Building	Immediately beneath foundation slab	None	6 feet below floor elevation	2	GW at 7 feet bgs; elevated naphthalene in SB106 at 4-8 feet bgs
SV102 – North side interior of Main Building, perimeter of holder	Immediately beneath foundation slab	None	6 feet below floor elevation	2	GW at 7 feet bgs; elevated naphthalene in SB108 at 4-6 feet bgs
SV103 – North side interior of Main Building	Immediately beneath foundation slab	None	6 feet below floor elevation	2	GW at 7 feet bgs
SV104 – South side interior of Main Building	Immediately beneath foundation slab	None	6 feet below floor elevation	2	GW at 7 feet bgs
SV105 - South side interior of Main Building, perimeter of holder	Immediately beneath foundation slab	None	6 feet below floor elevation	2	GW at 7 feet bgs
SV106 - South side interior of Main Building	Immediately beneath foundation slab	None	6 feet below floor elevation	2	GW at 7 feet bgs
SV107 – Outside Winter Building, within holder footprint (grass)	None	4.5 feet bgs	6 feet bgs, or above perched water in gas holder	2	Bottom of former gas holder at 7.5 feet bgs
SV108 - Outside Winter Building, within holder footprint (pavement)	None	3 feet bgs	6 feet bgs, or above perched water in gas holder	2	Bottom of former gas holder at 7.5 feet bgs
SV109 - Outside Winter Building, within holder footprint (grass)	None	4.5 feet bgs	6 feet bgs, or above perched water in gas holder	2	Bottom of former gas holder at 7.5 feet bgs
SV110 - Outside small building near Winter property (grass)	None	4.5 feet bgs	7.5 feet bgs	2	Adjacent former gas holder base at 7.5 ft
SV111 - Outside small building near Winter property (grass)	None	4.5 feet bgs	7.5 feet bgs	2	Adjacent former gas holder base at 7.5 ft

Table 6. Proposed Soil Vapor Sampling Locations and Depths

Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street, Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample ID and location	Sub Slab Depth	Shallow Sample Depth (5 ft or less)	Deep Sample Depth (> 5 ft)	Total No. of Samples	Rationale
SV112 - Outside Winter Building, within holder footprint (pavement)	None	3 feet bgs	6 feet bgs, or above perched water in gas holder	2	Bottom of former gas holder at 7.5 feet bgs
SV113 - Chicago Street Right-of-way	None	3 feet bgs	8 feet bgs	2	GW at 13 feet bgs
SV114 - Chicago Street Right-of-way	None	3 feet bgs	8 feet bgs	2	GW at 13 feet bgs
SV115 - Chicago Street Right-of-way	None	3 feet bgs	8 feet bgs	2	GW at 13 feet bgs
SV116 - Chicago Street Right-of-way Sanitary Manhole Backfill	None	None	Approx. 7 to 8 feet bgs	1	Based on utility depth
SV117 - Chicago Street Right-of-way Storm Inlet Backfill	None	Approx. 3.5 feet bgs	None	1	Based on utility depth
SV118 - Chicago Street Right-of-way Storm Manhole Backfill	None	Approx. 4 to 6 feet bgs	None	1	Based on utility depth
SV119 - Chicago Street Right-of-way Storm Inlet Backfill	None	Approx. 3.5 feet bgs	None	1	Based on utility depth
SV120- Winter Property along south property line (outside holder, grass)	None	4.5 feet bgs	7.5 feet bgs	2	Adjacent former gas holder base at 7.5 ft
SV121 - Winter Property along south property line (outside holder, grass)	None	4.5 feet bgs	7.5 feet bgs	2	Adjacent former gas holder base at 7.5 ft

Notes:
Depth listed is top of 0.5 foot screen.
bgs – Below ground surface
GW – Groundwater

Table 7. Sampling and Analysis Plan Summary for Soil Vapor Sampling

Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street, Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample Type/ Location	Proposed Number of Sampling Locations	Matrix / Laboratory	Parameter	Method	Per Sample Event			Container Type	Minimum Volume	Preservation	Holding Time from Sample Date
					Estimated Sample Quantity	Field Duplicates[1]	TOTAL[2]				
Soil Vapor	21	soil vapor/ fixed	BTEX, 1,2,4-Trimethylbenzene and Naphthalene	TO-15	38	2	40	Summa canister	Refer to Note 3	None	30 days
			Oxygen	ASTM D1946 or EPA 3C	38	2	40	Summa canister	Refer to Note 3	None	30 days
			Carbon Dioxide	ASTM D1946 or EPA 3C	38	2	40	Summa canister	Refer to Note 3	None	30 days
			Methane	ASTM D1946 or EPA 3C	38	2	40	Summa canister	Refer to Note 3	None	30 days

Notes:
1. Field duplicates will be collected at a frequency of one per group of twenty or fewer investigative soil vapor samples.
2. No MS/MSDs or equipment blanks required.
3. The size of the canister used for sampling will be determined by comparing laboratory reporting limits with screening criteria.

°C - Degrees Celcius
ASTM - American Society for Testing and Materials
BTEX - Benzene, toluene, ethylbenzene, and xylenes
EPA - United States Environmental Protection Agency
L - Liter
MS/MSD - Matrix spike/matrix spike duplicate

ENCLOSURE A

PERTINENT SOIL BORING LOGS

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPSC Manitowoc Former MGP Site		SB-103

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Tony Kapugi On-Site Environmental Services, Inc.	9/14/2009	9/14/2009	GeoProbe

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	Feet (NAVD)	589.5 Feet (NAVD)	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane 302,246 N, 232,653 E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Manitowoc	WI	Manitowoc

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	60 38		0 1 2 3 4 5	0 - 0.5' **ASPHALT:**. 0.5 - 2' **CONCRETE:** white. 2 - 3.5' **FILL, LEAN CLAY:** CL, brown), trace sand [], trace silt. 3.25' coal clinkers. 3.5 - 5' **FILL, FILL:** crushed orange brick.	(FILL) CL (FILL)			0 0 0						This log is the 4th attempt in this location. The first three hit refusal about 5 feet bgs. sampled 4 - 6'
	60 26		5 6 7 8	5 - 7' **LEAN CLAY:** CL, dark grayish brown (2.5Y 4/2), trace gravel []. 7 - 8.5' **GRAVELLY LEAN CLAY:** g(CL), brown (7.5YR 5/3), some gravel [].	CL g(CL)			0 2.9						
	60 46		9 10 11 12	8.5 - 11' **WELL-GRADED GRAVEL WITH SAND:** (GW)s, some angular to subangular sand [], black oil coating. 11 - 11.5' **LEAN CLAY WITH GRAVEL:** (CL)g, sheen, 4-inch stained concrete chunk, staining in clay, and sheen.	(GW)s (CL)g SP			40.1						sampled 10 - 12'

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, Ste. D Pewaukee, WI 53072	Fax:

NATURAL RESOURCE TECHNOLOGY

Boring Number SB-103

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			13	11.5 - 14.5' **POORLY-GRADED SAND:** SP, gray (10YR 5/1), black staining. *(continued)*	SP			0						
			14					0						
	60		15	14.5 - 15' **POORLY-GRADED SAND WITH SILT:** SP-SM, reddish gray (5YR 5/2).	SP-SM									
			16	15 - 20' **POORLY-GRADED SAND:** SP, gray (10YR 5/1), mostly sand [mostly fine], trace sheen on outside of core, likely drawdown.				0						sampled 16 - 18'
			17		SP									
			18					0						
			19											
			20	20' End of Boring.										

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPSC Manitowoc Former MGP Site		SB-104

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Tony Kapugi On-Site Environmental Services, Inc.	9/14/2009	9/14/2009	GeoProbe

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	Feet (NAVD)	589.4 Feet (NAVD)	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane 302,243 N, 232,735 E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Manitowoc	WI	Manitowoc

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	60 36		0	0 - 0.5' **ASPHALT:**.	(FILL)			0						
			1	0.5 - 2' **CONCRETE:** white.	(FILL)									
			2	2 - 3.3' **FILL, POORLY-GRADED SAND:** SP, brown (10YR 4/3), poorly graded, moist.	(FILL) SP			0						
			3											
			4	3.3 - 6.6' **LEAN CLAY:** CL, dark reddish brown (5YR 2.5/2), well graded, trace angular to subangular gravel [some fine, some coarse], moist.				0						sampled 4 - 6'
	60 36		5		CL									
			6					0						
			7	6.6 - 10.6' **POORLY-GRADED SAND:** SP, light brown (7.5YR 6/3), poorly graded, mostly sand [mostly fine], moist to wet.										
			8					0						
			9		SP									
			10											
	60 45							0						sampled 10 -12'
			11	10.6 - 15' **WELL-GRADED SAND:** SW, dark gray (10YR 4/1), well graded, mostly sand [some fine, some medium, some coarse], odor present, moist to wet, no visible impacts, less coarse with depth.	SW									
			12											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, Ste. D Pewaukee, WI 53072	Fax:

NATURAL RESOURCE TECHNOLOGY

Boring Number SB-104

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			13	10.6 - 15' **WELL-GRADED SAND:** SW, dark gray (10YR 4/1), well graded, mostly sand [some fine, some medium, some coarse], odor present, moist to wet, no visible impacts, less coarse with depth. *(continued)*	SW			0						
			14					0						
	60 57		15	15 - 20' **WELL-GRADED SAND:** SW, dark reddish gray (5YR 4/2), well graded, mostly sand [some fine, some medium, some coarse], odor present.										
			16					0						
			17		SW									
			18					0						sampled 18 - 20'
			19											
			20	20' End of Boring.										

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPSC Manitowoc Former MGP Site		SB-105

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Tony Kapugi On-Site Environmental Services, Inc.	9/14/2009	9/14/2009	GeoProbe

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	Feet (NAVD)	589.5 Feet (NAVD)	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane 302,241 N, 232,799 E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Manitowoc	WI	Manitowoc

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	60 39		0	0 - 0.4' **ASPHALT:**.	(FILL)			0						
			1	0.4 - 1.5' **CONCRETE:**.	(FILL)									
			2	1.5 - 3' **FILL, POORLY-GRADED SAND WITH SILT AND GRAVEL:** (SP-SM)g, dark brown (2.5YR 4/2), poorly graded, mostly sand [mostly fine], few gravel [mostly coarse], some silt, moist.	(FILL) (SP-SM)g			0						
			3	3 - 9.5' **POORLY-GRADED SAND:** SP, light brown (7.5YR 6/3), poorly graded, moist.										
			4					0						
	60 42		5											
			6		SP			0						sampled 6 - 8'
			7											
			8					0						
			9											
	60 34		10	9.5 - 20' **WELL-GRADED SAND:** SW, brown (7.5YR 5/3), well graded, moist to wet.				0						
			11		SW									
			12											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, Ste. D Pewaukee, WI 53072	Fax:

NATURAL RESOURCE TECHNOLOGY

Boring Number SB-105

Sample										Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			13	9.5 - 20' **WELL-GRADED SAND:** SW, brown (7.5YR 5/3), well graded, moist to wet. *(continued)*				0						
			14					0						
	60 53		15											
			16		SW			0						
			17											
			18					0						
			19											
			20	20' End of Boring.										

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPSC Manitowoc Former MGP Site		SB-106

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Tony Kapugi On-Site Environmental Services, Inc.	9/15/2009	9/15/2009	GeoProbe

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	Feet (NAVD)	589.5 Feet (NAVD)	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane 302,227 N, 232,639 E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Manitowoc	WI	Manitowoc

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	48 1		0	0 - 0.5' **CONCRETE**..				0						Poor recovery. Most recovery was from the bottom.
			1	0.5 - 7.5' **WELL-GRADED SAND WITH GRAVEL:** (SW)g, very pale brown (10YR 7/3), with red brick debris.										
			2											
			3											
	48 9		4		(SW)g			30.8						sampled 4 - 8'
			5											
			6											
			7											
			8	7.5 - 8' Oil-wetted sand and gravel.										
				8' End of Boring (refusal).										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, Ste. D Pewaukee, WI 53072	Fax:

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPSC Manitowoc Former MGP Site		SB-107

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Tony Kapugi On-Site Environmental Services, Inc.	9/14/2009	9/14/2009	GeoProbe

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	Feet (NAVD)	589.7 Feet (NAVD)	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane 302,228 N, 232,691 E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Manitowoc	WI	Manitowoc

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	48 29		0	0 - 0.25' **CONCRETE:**.				0						
			1	0.25 - 6.5' **POORLY-GRADED SAND:** SP, pinkish gray (7.5YR 6/2), poorly graded, mostly sand [mostly fine], moist.				0.2						
			2					0						
			3											
			4		SP			18						sampled 4 - 6'
	48 40		5											
			6					0						
			7	6.5 - 18' **POORLY-GRADED SAND:** SP, pinkish gray (7.5YR 6/2), poorly graded, mostly sand [mostly fine, some medium], moist.										
	48 48		8					0.3						
			9		SP									
			10	10' wet.				0.2						
			11											
			12											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, Ste. D Pewaukee, WI 53072	Fax:

NATURAL RESOURCE TECHNOLOGY

Boring Number SB-107

Sample									Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	48 48		13 14 15	6.5 - 18' **POORLY-GRADED SAND:** SP, pinkish gray (7.5YR 6/2), poorly graded, mostly sand [mostly fine, some medium], moist. *(continued)*	SP									
	48		16 17 18											
			19	18 - 20' **LEAN CLAY:** CL, brown (7.5YR 4/2).	CL									
			20	20' End of Boring.										

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPSC Manitowoc Former MGP Site		SB-108

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Tony Kapugi On-Site Environmental Services, Inc.	9/15/2009	9/15/2009	GeoProbe

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	Feet (NAVD)	589.5 Feet (NAVD)	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane 302,228 N, 232,734 E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Manitowoc	WI	Manitowoc

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	48 2		0 1 2 3	0 - 6' **WELL-GRADED SAND WITH GRAVEL:** (SW)g, very pale brown (10YR 7/2).	(SW)g			70.6						poor recovery sampled 0 - 2'
	24 4		4 5 6					350						sampled 4 - 6'
				6' End of Boring (refusal).										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, Ste. D Pewaukee, WI 53072	Fax:

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPSC Manitowoc Former MGP Site		SB-109

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Tony Kapugi On-Site Environmental Services, Inc.	9/15/2009	9/15/2009	GeoProbe

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	Feet (NAVD)	589.5 Feet (NAVD)	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane 302,228 N, 232,799 E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Manitowoc	WI	Manitowoc

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	48 28		0 1 2 3 4	0 - 1' **WELL-GRADED SAND WITH GRAVEL:** (SW)g, brown (7.5YR 4/3). 1 - 4' **POORLY-GRADED SAND WITH SILT:** SP-SM, some silt.	(SW)g SP-SM			0 0						
	48 32		4 5 6 7	4 - 12' **POORLY-GRADED SAND WITH SILT:** SP-SM, little silt. 5' wet.				0 0						
	48 31		8 9 10 11 12		SP-SM			0 0						sampled 8 - 10'

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, Ste. D Pewaukee, WI 53072	Fax:

NATURAL RESOURCE TECHNOLOGY

Boring Number SB-109

Sample									Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	48 46		13	12 - 20' **POORLY-GRADED SAND WITH SILT:** SP-SM, trace silt.				0						
			14					0						
			15											
	48		16		SP-SM			0						
			17											
			18					0						
			19											
			20	20' End of Boring.										

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPSC Manitowoc Former MGP Site		SB-110

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Tony Kapugi On-Site Environmental Services, Inc.	9/15/2009	9/15/2009	GeoProbe

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	Feet (NAVD)	589.6 Feet (NAVD)	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐

State Plane 302,200 N, 232,639 E S / C / N

1/4 of 1/4 of Section , T N, R

Lat ° ' "

Long ° ' "

Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Manitowoc	WI	Manitowoc

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	48 21		0	0 - 0.5' (FILL), **CONCRETE:**.	(FILL)			0						sampled 0 - 2'
			1	0.5 - 6.5' **FILL, POORLY-GRADED SAND:** SP, poorly graded, mostly sand [mostly fine], trace rounded gravel [], red brick debris.										
			2					0						
			3		(FILL) SP									
	30		4					0						sampled 4 - 6.5'
			5											
			6											
				6.5' End of Boring (refusal).										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, Ste. D Pewaukee, WI 53072	Fax:

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPSC Manitowoc Former MGP Site		SB-111

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Tony Kapugi On-Site Environmental Services, Inc.	9/15/2009	9/15/2009	GeoProbe

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	Feet (NAVD)	589.7 Feet (NAVD)	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane 302,193 N, 232,691 E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Manitowoc	WI	Manitowoc

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	48 36		0	0 - 0.25' **LEAN CLAY WITH SAND:** (CL)s, brown (10YR 4/3), trace gravel [], moist.	(CL)s			0						sampled 0 - 2'
			1	0.25 - 2.5' **SILTY CLAY:** very pale brown (10YR 7/4), trace sand.										
			2					0						
			3	2.5 - 4.5' **SILTY CLAY:** very pale brown (10YR 7/4), little sand.										
	48 30		4					0						
			5	4.5 - 10' **POORLY-GRADED SAND:** SP, very pale brown (10YR 7/3), poorly graded, mostly sand [mostly fine], little silt.										
			6					0						sampled 6 - 8'
			7		SP									
	48 37		8					0						
			9											
			10	10 - 12' **POORLY-GRADED SAND:** SP, very dark gray (N 3/), poorly graded, mostly sand [mostly fine], little silt, odor present, wet, no visible impacts.				2.5						
			11		SP									
			12											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, Ste. D Pewaukee, WI 53072	Fax:

NATURAL RESOURCE TECHNOLOGY

Boring Number SB-111

Sample									Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	48 48		13	12 - 20' **POORLY-GRADED SAND:** SP, brown (7.5YR 4/2), poorly graded, mostly sand [mostly fine], little silt, no odor.				3.2						sampled 12 - 14'
			14					1.3						
			15											
	48 24		16		SP			0						sampled 16 - 18'
			17											
			18					1						
			19											
			20	20' End of Boring.										

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPSC Manitowoc Former MGP Site		SB-112

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Tony Kapugi On-Site Environmental Services, Inc.	9/15/2009	9/15/2009	GeoProbe

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	Feet (NAVD)	589.6 Feet (NAVD)	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane 302,194 N, 232,735 E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Manitowoc	WI	Manitowoc

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	48 48		0	0 - 7' **POORLY-GRADED SAND:** SP, pale brown (10YR 6/3), poorly graded, mostly sand [mostly fine].				0						
			2	2' wet.				0						
			3		SP									
	48 46		4					0						sampled 4 - 6'
			5											
			6					2.4						
			7	7 - 7.5' **POORLY-GRADED SAND:** SP, gray (10YR 5/1), poorly graded, mostly sand [mostly medium].	SP									
	48 48		8	7.5 - 15' **POORLY-GRADED SAND:** SP, dark gray (N 4/), poorly graded, mostly sand [mostly medium].				10.9						sampled 8 - 10'
			9											
			10		SP			0						
			11											
			12											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, Ste. D Pewaukee, WI 53072	Fax:

NATURAL RESOURCE TECHNOLOGY

Boring Number SB-112

Sample										Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	36		13 14 15	7.5 - 15' **POORLY-GRADED SAND:** SP, dark gray (N 4/), poorly graded, mostly sand [mostly medium]. *(continued)*	SP			2.5 0						sampled 12 - 14'
				15' End of Boring (refusal).										

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPSC Manitowoc Former MGP Site		SB-113

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Tony Kapugi On-Site Environmental Services, Inc.	9/15/2009	9/15/2009	GeoProbe

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	Feet (NAVD)	589.6 Feet (NAVD)	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane 302,205 N, 232,799 E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Manitowoc	WI	Manitowoc

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	48 29		0	0 - 0.25' **CONCRETE:**.				0						
			1	0.25 - 2' **WELL-GRADED SAND:** SW, brown), well graded, trace subangular gravel [].	SW									sampled 0 - 2'
			2	2 - 2.5' **LEAN CLAY:** CL, brown (10YR 4/3).	CL			0						sampled 2 - 4'
			3	2.5 - 8' **POORLY-GRADED SAND:** SP, light yellowish brown (10YR 6/4), poorly graded, mostly sand [mostly fine].										
	48 29		4					0						
			5	5' wet.	SP									
			6					0						
			7											
	48 30		8	8 - 12' **POORLY-GRADED SAND:** SP, light yellowish brown (10YR 6/4), poorly graded, mostly sand [mostly medium].				0						sampled 8 -10'
			9											
			10		SP			0						
			11											
			12											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, Ste. D Pewaukee, WI 53072	Fax:

NATURAL RESOURCE TECHNOLOGY

Boring Number SB-113

Sample										Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	48		13	12 - 20' **POORLY-GRADED SAND:** SP, brown (10YR 5/3), poorly graded, mostly sand [mostly medium].				0						
			14					0						
			15											
	48		16		SP			0						
			17											
			18					0						
			19											
			20	20' End of Boring.										

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPSC Manitowoc Former MGP Site		SB-114

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Tony Kapugi On-Site Environmental Services, Inc.	9/14/2009	9/14/2009	GeoProbe

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	Feet (NAVD)	599.8 Feet (NAVD)	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane 302,182 N, 232,732 E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Manitowoc	WI	Manitowoc

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	60 29		0	0 - 0.5' **TOPSOIL:** brown).				9.5						sampled 0 - 2'
			1	0.5 - 5' **WELL-GRADED SAND:** SW, brown (10YR 4/3), well graded, mostly sand [], few gravel [], dry to moist.	SW			9.2						
			2											
			3											
			4					18.6						
	60 28		5	5 - 12.5' **WELL-GRADED SAND:** SW, brown (10YR 4/3), well graded, mostly sand [], few gravel [], moist.										
			6					20.1						
			7											
			8		SW			20						sampled 8 - 10'
			9											
	60 32		10					18.4						
			11											
			12											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, Ste. D Pewaukee, WI 53072	Fax:

NATURAL RESOURCE TECHNOLOGY

Boring Number SB-114

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
								22.8						sampled 12 - 14'
			13	12.5 - 15' **LEAN CLAY WITH GRAVEL:** (CL)g, dark brown (7.5YR 3/4), firm, some gravel [], moist.										
			14	14' - 16' sheen and odor present.	(CL)g			25.8						
	24		15	15 - 17' **WELL-GRADED SAND:** SW, gray (10YR 6/1), odor present, sheen, riverbed sand.										
	21		16	16' oil wetted to 17'.	SW			473						sampled 16 - 17'
			17	17' End of Boring (refusal).										

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPSC Manitowoc Former MGP Site		SB-115

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Tony Kapugi On-Site Environmental Services, Inc.	9/14/2009	9/14/2009	GeoProbe

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	Feet (NAVD)	600.9 Feet (NAVD)	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane 302,182 N, 232,794 E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Manitowoc	WI	Manitowoc

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	60 35		0	0 - 1' **CONCRETE:**.				0.7						sampled 0 - 2'
			1	1 - 1.5' **LEAN CLAY:** CL, dark reddish gray (5YR 4/2), moist.	CL									
			2	1.5 - 6.5' **POORLY-GRADED SAND:** SP, light brown (7.5YR 6/4), poorly graded, mostly sand [mostly fine], trace silt, moist.				0.9						
			3											
			4		SP			0.5						
	60 43		5											
			6					2						
			7	6.5 - 7' **LEAN CLAY:** CL, light brown (7.5YR 6/4).	CL									
			8	7 - 10' **POORLY-GRADED SAND:** SP, light brown (7.5YR 6/4), poorly graded, mostly sand [mostly fine], trace silt, moist.	SP			1						
			9											
	60 45		10	10 - 18' **POORLY-GRADED SAND WITH CLAY:** SP-SC, light brown (7.5YR 6/4), poorly graded, mostly sand [mostly fine], some clay, trace silt, moist.	SP-SC			1.7						sampled 10 - 12'
			11											
			12											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, Ste. D Pewaukee, WI 53072	Fax:

NATURAL RESOURCE TECHNOLOGY

Boring Number SB-115

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			13	10 - 18' **POORLY-GRADED SAND WITH CLAY:** SP-SC, light brown (7.5YR 6/4), poorly graded, mostly sand [mostly fine], some clay, trace silt, moist. *(continued)*				0.9						
			14					2.2						
	60 40		15		SP-SC									
			16					0.2						
			17											
			18	18 - 25' **POORLY-GRADED SAND:** SP, light brown (7.5YR 6/4), poorly graded, mostly sand [mostly fine], trace silt, moist.				0.7						sampled 18 - 20'
			19											
	60		20					0.9						
			21											
			22	22' wet.	SP			2.1						
			23											
			24					1.3						
			25	25' End of Boring.										

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPSC Manitowoc Former MGP Site		SB-116

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Tony Kapugi On-Site Environmental Services, Inc.	9/14/2009	9/14/2009	GeoProbe

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	Feet (NAVD)	596.8 Feet (NAVD)	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane 302,161 N, 232,686 E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Manitowoc	WI	Manitowoc

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	60 45		0	0 - 0.5' **FILL, TOPSOIL:**.	(FILL)			0						sampled 0 - 2'
			1	0.5 - 1.75' **FILL, LEAN CLAY WITH GRAVEL:** (CL)g, pinkish gray (7.5YR 6/2), some angular to subangular gravel [], no odor, topsoil, grass and root matter.	(FILL) (CL)g									
CS			2	1.75 - 5' **FILL, LEAN CLAY:** CL, reddish yellow (7.5YR 6/8), trace sand [], trace silt, moist, increasing sand with depth.				0						
			3		(FILL) CL									
CS			4					0						
	60 45		5	5 - 6' **FILL, POORLY-GRADED SAND:** SP, poorly graded, mostly sand [mostly fine].	(FILL) SP									
CS			6	6 - 7.25' **FILL, LEAN CLAY:** CL, trace sand [], trace concrete.	(FILL) CL			0						
			7											
CS			8	7.25 - 17' **POORLY-GRADED SAND:** SP, strong brown (7.5YR 5/6), poorly graded, mostly sand [mostly medium], trace silt.				0						
			9											
			10		SP									
	60 39		11					0						
			12											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, Ste. D Pewaukee, WI 53072	Fax:

NATURAL RESOURCE TECHNOLOGY

Boring Number SB-116

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			13	7.25 - 17' **POORLY-GRADED SAND:** SP, strong brown (7.5YR 5/6), poorly graded, mostly sand [mostly medium], trace silt. *(continued)*				0						
			14					0						sampled 14 - 16'
	60 53		15	15' wet.	SP									
			16					0						
			17	17 - 25' **POORLY-GRADED SAND:** SP, grayish brown (10YR 5/2), poorly graded, mostly sand [mostly medium], trace silt, 30% black staining, odor present.										
			18					0						
			19											
	60 41		20	20' 90% black staining, odor present.				0						sampled 20 - 22'
			21		SP									
			22					0						
			23											
			24	23.5' no staining.				0						
	60 35		25	25 - 30' **POORLY-GRADED SAND:** SP, grayish brown (10YR 5/2), poorly graded, mostly sand [mostly medium], trace silt, no odor, no staining.										
			26					0						sampled 26 - 28'
			27											
			28		SP									
			29											
			30	30' End of Boring.										

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPSC Manitowoc Former MGP Site		SB-117

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Tony Kapugi On-Site Environmental Services, Inc.	9/14/2009	9/14/2009	GeoProbe

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	Feet (NAVD)	599.2 Feet (NAVD)	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane 302,173 N, 232,732 E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Manitowoc	WI	Manitowoc

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	60 46		0	0 - 0.5' **TOPSOIL:**.				0						sampled 0 - 2'
			1	0.5 - 3.5' **FILL, LEAN CLAY WITH GRAVEL:** (CL)g, brown), some subangular to subrounded gravel [], dry to moist.	(FILL) (CL)g									
			2					0						
			3											
			4	3.5 - 5' **CONCRETE:**.	(FILL)			0						
	60 36		5	5 - 7' **POORLY-GRADED SAND:** SP, yellowish brown (10YR 5/4), mostly sand [mostly fine], trace silt.										
			6		SP			0						
			7	7 - 8' **LEAN CLAY:** CL, yellowish brown (10YR 5/4), 5% gray) mottling, firm, moist.	CL									
			8	8 - 15' **POORLY-GRADED SAND:** SP, yellowish brown (10YR 5/4), mostly sand [mostly fine], trace silt.				0						
			9											
	60 44		10		SP			0						
			11											
			12											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm Natural Resource Technology, Inc.
23713 W. Paul Road, Ste. D Pewaukee, WI 53072
Tel:
Fax:

NATURAL RESOURCE TECHNOLOGY

Boring Number SB-117

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			13	8 - 15' **POORLY-GRADED SAND:** SP, yellowish brown (10YR 5/4), mostly sand [mostly fine], trace silt. *(continued)*	SP			0						sampled 12 - 14'
			14	14' 3 inches of black (10YR 2/1), no odor.				0						
	60 28		15 16	15 - 20' **POORLY-GRADED SAND:** SP, brown (7.5YR 5/2), mostly sand [mostly fine], trace silt, moist, petroleum-like odor.				0						
			17 18		SP			0						
			19											
	60 60		20 21	20 - 28' **POORLY-GRADED SAND:** SP, black (N 2.5/), mostly sand [mostly fine], trace silt, odor present, wet.				0						sampled 20 - 22'
			22					0						
			23 24		SP			0						
	60 40		25 26					0						
			27											
			28	28 - 34' **POORLY-GRADED SAND:** SP, gray (N4/), mostly sand [mostly fine], some silt, no odor, wet.				0						
			29											
	48 35		30 31		SP			0						sampled 30 - 32'
			32											

NATURAL RESOURCE TECHNOLOGY

Boring Number SB-117

Sample									Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			33	28 - 34' **POORLY-GRADED SAND:** SP, gray (N4/), mostly sand [mostly fine], some silt, no odor, wet. *(continued)*	SP			0						
			34	34' End of Boring.										

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPSC Manitowoc Former MGP Site		SB-118

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Tony Kapugi On-Site Environmental Services, Inc.	9/14/2009	9/14/2009	GeoProbe

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	Feet (NAVD)	600.3 Feet (NAVD)	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane 302,169 N, 232,792 E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Manitowoc	WI	Manitowoc

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	60 33		0	0 - 1' **CONCRETE:** white.	(FILL)			1.7						sampled 0 - 2'
			1	1 - 1.5' **FILL, POORLY-GRADED SAND:** SP, brown (10YR 4/3), poorly graded, mostly sand [mostly fine], moist.	(FILL) SP									
			2	1.5 - 3.75' **FILL, LEAN CLAY WITH GRAVEL:** (CL)g, dark brown (10YR 3/3), some subangular to subrounded gravel [].	(FILL) (CL)g			2.5						
			3											
			4	3.75 - 5' **WELL-GRADED SAND WITH GRAVEL:** (SW)g, very pale brown (10YR 7/4), well graded, mostly sand [], some gravel [].	(SW)g			1.8						
	60 46		5	5 - 5.75' **SILTY CLAY:** light yellowish brown (10YR 6/4), moist.										
			6	5.75 - 12' **POORLY-GRADED SAND:** SP, very pale brown (10YR 7/4), poorly graded, mostly sand [].				1.7						sampled 6 - 8'
			7											
			8					1.3						
			9		SP									
	60 45		10					2.3						
			11											
			12											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, Ste. D Pewaukee, WI 53072	Fax:

NATURAL RESOURCE TECHNOLOGY

Boring Number SB-118

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			12	12 - 15' **LEAN CLAY:** CL, light yellowish brown (10YR 6/4), trace silt.				1.2						
			13											
			14		CL			1.7						
			15											
	60 16		16	15 - 25' **POORLY-GRADED SAND:** SP, light yellowish brown (10YR 6/4), poorly graded, mostly sand [], no visible impacts, no odor.				0.9						
			17											
			18					0.9						sampled 18 - 20'
			19											
	60 47		20		SP			2.5						
			21											
			22					2.3						
			23											
			24					2.1						
			25	25' End of Boring.										

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPSC Manitowoc Former MGP Site		SB-119

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Tony Kapugi On-Site Environmental Services, Inc.	9/14/2009	9/14/2009	GeoProbe

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	Feet (NAVD)	601.4 Feet (NAVD)	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane 302,058 N, 232,815 E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Manitowoc	WI	Manitowoc

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	60 36		0	0 - 0.5' **TOPSOIL:**.				0						sampled 0 - 2'
			1	0.5 - 6' **FILL, LEAN CLAY:** CL, dark reddish gray (5YR 4/2), firm, trace silt, moist.										
			2					0						
			3		(FILL) CL									
			4	3.5' color change to red (2.5YR 4/8), firm.				0						
	60 36		5											
			6	6 - 8' **FILL, LEAN CLAY WITH GRAVEL:** (CL)g, some sand [], some gravel [mostly coarse], moist.				0						
			7		(FILL) (CL)g									
			8	8 - 17' **FILL, WELL-GRADED SAND WITH GRAVEL:** (SW)g, brown (7.5YR 5/4), some subangular to subrounded gravel [].				0						sampled 8 - 10'
			9											
	60 36		10		(FILL) (SW)g			0						
			11											
			12											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, Ste. D Pewaukee, WI 53072	Fax:

NATURAL RESOURCE TECHNOLOGY

Boring Number SB-119

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			13	8 - 17' **FILL, WELL-GRADED SAND WITH GRAVEL:** (SW)g, brown (7.5YR 5/4), some subangular to subrounded gravel []. *(continued)*	(FILL) (SW)g			6						
	60 52		14					0						
			15											
			16					0						
			17	17 - 20' **POORLY-GRADED SAND:** SP, light brown (7.5YR 6/3), poorly graded, mostly sand [mostly fine].										
			18	18' wet.	SP			0						sampled 18 - 20'
			19											
			20	20' End of Boring.										

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPSC Manitowoc Former MGP Site		SB-120

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Tony Kapugi On-Site Environmental Services, Inc.	9/14/2009	9/14/2009	GeoProbe

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	Feet (NAVD)	602.3 Feet (NAVD)	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane 302,080 N, 232,917 E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Manitowoc	WI	Manitowoc

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	60 51		0 1 2 3 4 5	0 - 1' **TOPSOIL:**. 1 - 1.5' **SILT WITH SAND:** to **SILT WITH GRAVEL:** (ML)s, dark brown). 1.5 - 25' **FILL, WELL-GRADED SAND WITH GRAVEL:** (SW)g, well graded, mostly sand [some fine, some medium, some coarse], some gravel [some fine, some coarse], dry, mottled white, brown and red, no visual impacts, no odor.	(ML)s			0 0 6.4						sampled 0 - 2'
	60 47		6 7 8 9		(FILL) (SW)g			2.8 0						
	120 43		10 11 12					0						sampled 10 - 14'

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, Ste. D Pewaukee, WI 53072	Fax:

NATURAL RESOURCE TECHNOLOGY

Boring Number SB-120

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			13	1.5 - 25' **FILL, WELL-GRADED SAND WITH GRAVEL:** (SW)g, well graded, mostly sand [some fine, some medium, some coarse], some gravel [some fine, some coarse], dry, mottled white, brown and red, no visual impacts, no odor. *(continued)*										
			14					0						
			15											
			16											
			17											
			18		(FILL) (SW)g			0						
			19											
	120 30		20	20' wet.				0						
			21											
			22											
			23											
			24					0						sampled 24 - 28'
			25	25 - 30' **WELL-GRADED GRAVEL:** GW, well graded, mostly subangular to subrounded gravel [some fine, some coarse], wet, no visible impacts.										Poor Recovery. Contact is approximate.
			26											
			27		GW									
			28					0						
			29											
			30	30' End of Boring.										

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPSC Manitowoc Former MGP Site		SB-121

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Tony Kapugi On-Site Environmental Services, Inc.	9/14/2009	9/14/2009	GeoProbe

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	Feet (NAVD)	601.6 Feet (NAVD)	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane 301,977 N, 232,915 E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Manitowoc	WI	Manitowoc

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	60 39		0	0 - 2' **TOPSOIL:**.				5						sampled 0 - 2'
			2	2 - 4' **LEAN CLAY:** CL, reddish brown (5YR 5/3), trace gravel [mostly fine].	CL			7						
			4	4 - 20' **FILL, WELL-GRADED SAND WITH GRAVEL:** (SW)g, well graded, mostly sand [some fine, some medium, some coarse], some gravel [some fine, some coarse], dry, mottled white, brown and red, no visual impacts, no odor.	(FILL) (SW)g			4.8						
	60 26		5											
			6					6.7						
			7											
			8					6.6						sampled 8 - 10'
			9											
	120 47		10					4.7						
			11											
			12											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm Natural Resource Technology, Inc.
23713 W. Paul Road, Ste. D Pewaukee, WI 53072
Tel:
Fax:

NATURAL RESOURCE TECHNOLOGY

Boring Number SB-121

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			13	4 - 20' **FILL, WELL-GRADED SAND WITH GRAVEL:** (SW)g, well graded, mostly sand [some fine, some medium, some coarse], some gravel [some fine, some coarse], dry, mottled white, brown and red, no visual impacts, no odor. *(continued)*	(FILL) (SW)g									
			14					9						
			15											
			16											
			17											
			18					7.6						
			19											
	60 27		20	20 - 25' **WELL-GRADED GRAVEL:** GW, well graded, few sand [mostly coarse], mostly subangular to subrounded gravel [], wet.	GW			8						sampled 20 - 24'
			21											
			22					8.6						
			23											
			24					13.3						
			25	25' End of Boring.										

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPSC Manitowoc Former MGP Site		SB-122

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Tony Kapugi On-Site Environmental Services, Inc.	9/14/2009	9/14/2009	GeoProbe

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	Feet (NAVD)	601.7 Feet (NAVD)	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane 302,036 N, 232,816 E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Manitowoc	WI	Manitowoc

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	120 40		0	0 - 1' **TOPSOIL:**.				62.6						sampled 0 - 2'
			1	1 - 7.5' **FILL, WELL-GRADED SAND:** SW, brown (7.5YR 4/3), organics, coarse gravel-sized pieces of brick, no visible impacts.										
			2					50.8						sampled 2 - 6'
			3											
			4		(FILL) SW									
			5											
			6					279						
			7											
			8	7.5 - 7.75' **CONCRETE:** possbile bottom of holder.										
			9	7.75 - 15' **FILL, WELL-GRADED SAND:** SW, black stained, strong odors, most grains are composed of long, flat "platy" crystals, mottled gray and black (50/50), black appears to be staining.										Laboratory analysis indicates that platy crystals are solid phase naphthalene.
	60 44		10		(FILL) SW			517						
			11											
			12											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, Ste. D Pewaukee, WI 53072	Fax:

NATURAL RESOURCE TECHNOLOGY

Boring Number SB-122

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			13	7.75 - 15' **FILL, WELL-GRADED SAND:** SW, black stained, strong odors, most grains are composed of long, flat "platy" crystals, mottled gray and black (50/50), black appears to be staining. *(continued)*	(FILL) SW			1256						sampled 12 - 14'
			14					409						
	120 39		15	15 - 25' **POORLY-GRADED SAND:** SP, dark brown (7.5YR 3/4), trace silt, wet, strong odors, no visible impacts.										
			16					538						
			17											
			18					290						
			19											
			20		SP			576						
			21											
			22											
			23											
			24					420						
	120 40		25	25 - 45' **WELL-GRADED SAND:** SW, light gray (N 7/), mostly sand [some fine, some medium, some coarse], few gravel [mostly fine], odors present.										
			26											
			27											
			28	27.5' - 28': stained black.	SW			65.4						sampled 28 - 30'
			29											
			30	30' little gravel becomes fine to coarse, no visible impacts below.				87.1						
			31											
			32											

NATURAL RESOURCE TECHNOLOGY

Boring Number SB-122

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			33	25 - 45' **WELL-GRADED SAND:** SW, light gray (N 7/), mostly sand [some fine, some medium, some coarse], few gravel [mostly fine], odors present. *(continued)*										
			34					78.6						
	60 24		35											
			36											
			37											
			38					279						sampled 38 - 40'
			39		SW									
	60		40	40' 2-inches of soft clay in shoe, no visible impacts below, odors less intense.				110						
			41											
			42					75.1						sampled 42 - 44'
			43											
			44					63.2						
			45	45' End of Boring.										

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPSC Manitowoc Former MGP Site		SB-123

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Tony Kapugi On-Site Environmental Services, Inc.	9/15/2009	9/15/2009	GeoProbe

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	Feet (NAVD)	602.1 Feet (NAVD)	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane 302,019 N, 232,885 E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Manitowoc	WI	Manitowoc

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	48 33		0	0 - 0.5' **CONCRETE SUBGRADE:** coarse white gravel.	(FILL)			0						sampled 0 - 2'
			1	0.5 - 5' **FILL, WELL-GRADED SAND:** SW, dark brown), well graded, trace gravel [mostly fine], dry, large brick fragment at 5'.										
			2					0						
			3		(FILL) SW									
	42 33		4					0						
			5	5 - 6' **WELL-GRADED SAND:** SW, dark brown), well graded, mostly sand [some fine, some medium, some coarse], wet, no visible impacts.	SW									
			6	6 - 7.5' **SILT:** ML, black), some sand [mostly fine], trace gravel [mostly fine], trace organics/roots, strong odors, black is likely staining.	ML			874						sampled 6 - 7.5'
			7											
				7.5' End of Boring (refusal).										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, Ste. D Pewaukee, WI 53072	Fax:

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPSC Manitowoc Former MGP Site		SB-124

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Tony Kapugi On-Site Environmental Services, Inc.	9/15/2009	9/15/2009	GeoProbe

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	Feet (NAVD)	602.2 Feet (NAVD)	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane 301,990 N, 232,872 E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Manitowoc	WI	Manitowoc

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	48 33		0 1 2 3 4	0 - 1' **TOPSOIL:**. 1 - 4' **FILL, POORLY-GRADED SAND:** SP, light brown), 20% black) mottling, poorly graded, mostly sand [mostly medium], no odor, dry, trace woody debris, no visual impacts.	(FILL) SP			0 0						sampled 0 - 2' sampled 2 - 4'
	44 36		5 6 7	4 - 6.5' **FILL, WELL-GRADED SAND:** SW, dark brown), well graded, trace gravel [mostly fine], dry. 6' wet. 6.5 - 7.8' **FILL, GRAVELLY LEAN CLAY:** g(CL), very dark brown), little gravel [mostly fine], moist, no visible impacts, strong odor.	(FILL) SW (FILL) g(CL)			0 146						sampled 6 - 7.8'
				7.8' End of Boring (refusal - concrete).										concrete chips were blue-green colored

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, Ste. D Pewaukee, WI 53072	Fax:

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPSC Manitowoc Former MGP Site		SB-125

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Tony Kapugi On-Site Environmental Services, Inc.	9/15/2009	9/15/2009	GeoProbe

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	Feet (NAVD)	589.6 Feet (NAVD)	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane 302,205 N, 232,746 E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Manitowoc	WI	Manitowoc

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	48 20		0 1 2	0 - 0.25' **CONCRETE:**. 0.25 - 2.5' **WELL-GRADED SAND WITH GRAVEL:** (SW)g, dark yellowish brown (10YR 4/4).	(SW)g			0 0						sampled 0 - 2'
			3	2.5 - 4' **POORLY-GRADED SAND:** SP, mostly sand [mostly fine].	SP									
	48 28		4 5	4 - 5' **POORLY-GRADED SAND:** SP, mostly sand [mostly fine], some silt, 2 inch silty clay layer at 5'.	SP			0						
			6	5 - 11' **SILTY CLAY:** wet.				0						sampled 6 - 8'
	48 48		7 8 9	7.5' gray.				10.1						
			10					6.1						sampled 10 - 12'
			11 12	11 - 20' **POORLY-GRADED SAND:** SP, very dark gray (N 3/), mostly sand [mostly medium, little coarse], odor present, no visible impacts.	SP									

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, Ste. D Pewaukee, WI 53072	Fax:

NATURAL RESOURCE TECHNOLOGY

Boring Number SB-125

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
	48		13	11 - 20' **POORLY-GRADED SAND:** SP, very dark gray (N 3/), mostly sand [mostly medium, little coarse], odor present, no visible impacts. *(continued)* 12' color change to black.				0.2						
			14					1.2						
			15											
	48		16		SP			11.3						
			17											
			18					0						sampled 18 - 20'
			19											
			20	20' End of Boring.										

ENCLOSURE B

TIER 1 AND TIER 2 SOIL VAPOR ASSESSMENT

ATTACHMENTS

1. Vapor Intrusion Pathway Summary Page
2. Initial Vapor Intrusion Screen for Integrys MGP sites including Table 1
3. Building Construction and Use Information

VII. VAPOR INTRUSION PATHWAY SUMMARY PAGE

Facility Name: WPSC MANITOWOC FORMER MGP SITE

Facility Address: 402 NORTH TENTH ST., MANITOWOC, WI

Primary Screening Summary

☐ *Q1: Constituents of concern Identified?*

__X__ *Yes*

_____ *No* (If NO, skip to the conclusion section below and check NO to indicate the pathway is *incomplete.)*

☐ *Q2: Currently inhabited buildings near subsurface contamination?*

__X__ *Yes*

_____ *No*

Areas of future concern near subsurface contamination?

_____ *Yes*

__X__ *No* (If NO, skip to the conclusion section below and check NO to indicate the pathway is *incomplete.)*

☐ *Q3: Immediate Actions Warranted?*

_____ *Yes*

__X__ *No*

Secondary Screening Summary

☐ *Vapor source identified:*

_____ *Groundwater*

__X__ *Soil*

_____ *Insufficient data*

☐ *Indoor air data available?*

_____ *Yes*

__X__ *No*

☐ *Indoor air concentrations exceed target levels?*

_____ *Yes*

_____ *No*

2/15/10

MANITOWOC FORMER MGP

☐ *Subsurface data evaluation: (Circle appropriate answers below)*

Medium	Q4 Levels Exceeded?	Q5 Levels Exceeded?	Data Indicates Pathway is Complete?
Groundwater	YES / NO / NA / INS	YES / NO / NA / INS	YES / NO / INS
Soil Gas	YES / NO / NA / INS	YES / NO / NA / INS	YES / NO / INS

NA = not applicable
INS = insufficient data available to make a determination

Site-Specific Summary

☐ *Have the nature and extent of subsurface contamination, potential preferential pathways and overlying building characteristics been adequately characterized to identify the most-likely-to-be-impacted buildings?*

_____ *Yes*

_____ *No*

_____ *N/A*

EPA recommends that if a model was used, it be an appropriate and applicable model that represents the conceptual site model. If other means were used, document how you determined the potentially most impacted areas to sample. EPA recommends that predictive modeling can be used to support Current Human Exposures Under Control EI determinations without confirmatory sampling to support this determination. Current Human Exposures Under Control EI determinations are intended to reflect a reasonable conclusion by EPA or the State that current human exposures are under control with regard to the vapor intrusion pathway and current land use conditions. Therefore, if conducting evaluation for an EI determination, document that the **Pathway is Incomplete** and/or does not pose an unacceptable risk to human health for EI determinations.

☐ *Are you making an EI determination based on modeling and does the model prediction indicate that determination is expected to be adequately protective to support Current Human Exposures Under Control EI determinations?*

_____ *Yes*

_____ *No*

_____ *N/A*

☐ *Do subslab vapor concentrations exceed target levels?*

_____ *Yes*

_____ *No*

_____ *N/A*

2/15/10

☐ *Do indoor air concentrations exceed target levels?*

_____ *Yes*

_____ *No*

Conclusion

Is there a Complete Pathway for subsurface vapor intrusion to indoor air?

Below, check the appropriate conclusion for the Subsurface Vapor to Indoor Air Pathway evaluation and attach supporting documentation as well as a map of the facility.

_____ NO - the "Subsurface Vapor Intrusion to Indoor Air Pathway" has been verified to be incomplete for the _____ facility, EPA ID #_____, located at _____. This determination is based on a review of site information, as suggested in this guidance, check as appropriate:

_____ for current and reasonably expected conditions, or

_____ based on performance monitoring evaluations for engineered exposure controls. This determination may be re-evaluated, where appropriate, when the Agency/State becomes aware of any significant changes at the facility.

_____ YES –The "Subsurface Vapor to Indoor Air Pathway" is Complete. Engineered controls, avoidance actions, or removal actions taken include: _____

_____

_____

_____ UNKNOWN - More information is needed to make a determination.

Locations where References may be found:

_____

_____

_____

_____

_____

Contact telephone and e-mail numbers:

(name) _____

(phone #) _____

(e-mail) _____

2/15/10

Attachment (2)

Initial Vapor Intrusion Screen for Integrys MGP Sites

An initial vapor intrusion screening assessment was performed for the MGP-related constituents being evaluated at the Integrys MGP sites. This list of MGP-related constituents under consideration is presented in the Risk Assessment Framework (Exponent 2007), and in the attached Table 1. This initial screening followed the general approach of the Tier 1/Question 1 screening process presented in Table 1 of the *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance)* (U.S. EPA 2002). This process evaluates whether a compound is both: 1) sufficiently volatile to result in potentially significant vapor intrusion and 2) sufficiently toxic to result in potentially unacceptable indoor air inhalation risks. If the compound fails either criterion, it is not considered further for this pathway.

Within the subsurface vapor intrusion guidance, the single factor used to determine volatility was whether a compound had a Henry's Law constant of 1×10^{-5} atm-m^3/mole or greater (U.S. EPA 2002). The more current approach used by EPA for determining volatility from a risk assessment perspective is presented in the Regional Screening Level (RSL) technical document (U.S. EPA 2009). For the RSLs, two factors are used to determine volatility of a compound: that a compound have a Henry's Law constant of 1×10^{-5} atm-m^3/mole or greater in addition to having a molecular weight less than 200 g/mole. This classification of a whether or not a compound was sufficiently volatile was the first criterion used in this assessment to characterize the MGP-related compounds (Table 1). Most MGP-related constituents are not sufficiently volatile to require evaluation for the vapor intrusion pathway.

For those MGP-related compounds that are sufficiently volatile, the second criteria of inhalation toxicity was considered (i.e., is the compound sufficiently toxic). In the 2002 subsurface vapor intrusion guidance, EPA first determined the maximum pure component vapor phase concentration of each volatile compound, and then determined if that maximum concentration would result in human health risks above acceptable risk-based targets (cancer risk of 1×10^{-6} or hazard quotient of 1). For this assessment, sufficiently toxic was defined more simply by the presence of an inhalation toxicity value in a source currently recognized by EPA (as presented in the RSL technical guidance document, U.S. EPA 2009). This simplified approach to determining sufficient toxicity is potentially more conservative (i.e., it could screen in more compounds than the 2002 EPA approach). If a compound was found to be both sufficiently volatile and sufficiently toxic, then it was determined to be a compound of potential concern (COPC) for the vapor intrusion pathway. For compounds determined to be COPCs through this vapor intrusion screening process, measures of applicable media (i.e., soil gas or indoor air) would be required if the compound is detected at an MGP site in soil or groundwater within close proximity (within 100 feet) of buildings. This initial screening resulted in a short list of COPCs for the vapor intrusion pathway: benzene, toluene, ethylbenzene, xylenes (BTEX), 1,2,4-trimethylbenzene, and naphthalene (Table 1).

References

U.S. EPA. 2002. OSWER draft guidance for evaluating the vapor intrusion to indoor air pathway from groundwater and soils (subsurface vapor intrusion guidance). EPA530-F-02-052. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, DC.

U.S. EPA. 2009. Regional screening levels for chemical contaminants at Superfund sites. Available at: www.epa.gov/region/superfund/ prg/index.html. Updated December 2009. Accessed April 27, 2010. U.S. Environmental Protection Agency, Regions 3, 6, and 9.

Table 1. MGP-related compounds of potential concern: Step 1 screening assessment for vapor intrusion

Project Compound List	Criterion 1: Sufficiently Volatile	Criterion 2: Sufficiently Toxic	Vapor Intrusion COPC
PVOCs			
Benzene	YES	YES	**X**
Ethylbenzene	YES	YES	**X**
Toluene	YES	YES	**X**
Xylenes (total)	YES	YES	**X**
1,2,4-Trimethylbenzene	YES	YES	**X**
1,3,5-Trimethylbenzene	YES	NA	
Semivolatile Organic Compounds			
PAHs			
Acenaphthene	YES	NA	
Acenaphthylene	YES[a]	NA	
Anthracene	YES	NA	
Benzo[a]anthracene	NO	--	
Benzo[b]fluoranthene	NO	--	
Benzo[k]fluoranthene	NO	--	
Benzo[a]pyrene	NO	--	
Benzo[g,h,i]perylene	NO[b]	--	
Chrysene	NO	--	
Dibenz[a,h]anthracene	NO	--	
Fluoranthene	NO	--	
Fluorene	YES	NA	
Indeno[1,2,3-cd]pyrene	NO	--	
Naphthalene	YES	YES	**X**
Phenanthrene	YES[c]	NA	
Pyrene	YES	NA	
2-Methylnaphthalene	YES	NA	
Phenols			
2,4-Dimethylphenol	NO	--	
2-Methylphenol	NO	--	
4-Methylphenol	NO	--	
Phenol	NO	--	
Inorganics			
Aluminum	NO	--	
Antimony	NO	--	
Arsenic	NO	--	
Barium	NO	--	
Cadmium	NO	--	
Chromium	NO	--	
Copper	NO	--	
Cyanide	NO[d]	--	
Iron	NO	--	
Lead	NO	--	
Manganese	NO	--	
Mercury	NO[e]	--	
Nickel	NO	--	
Selenium	NO	--	
Silver	NO	--	
Vanadium	NO	--	
Zinc	NO	--	

(footnote on following page)

Table 1. (cont.)

-- – Compound not sufficiently volatile so criterion 2 not considered.
NA – Inhalation toxicity value not currently available from EPA-approved source.
COPC – compound of potential concern
PAH – polynuclear aromatic hydrocarbon
PVOC – petroleum volatile organic compound

Criteria 1: Sufficiently volatile. The determination of sufficiently volatile was updated to reflect the current two-pronged approach reflected in the Regional Screening Level (RSL) technical document, which considers a compound volatile if it has a Henry's Law constant of 1×10^{-5} atm-m^3/mole or greater and has a molecular weight less than 200 g/mole.

Criteria 2: Sufficiently toxic. This criterion is considered only if the compound is sufficiently volatile. A compound is considered to be sufficiently toxic if it has an inhalation toxicity value in the RSL tables (U.S. EPA 2009 [December]). If there is no inhalation toxicity value available in the RSL tables, then the compound is not considered further for this pathway, because of a lack of an EPA-recognized toxicity value that could be used in a risk assessment.

Vapor Intrusion COPC: Chemicals that meet both Criteria 1 and 2 are considered chemicals of potential concern requiring measurement in media applicable to a vapor intrusion assessment (e.g., soil gas, indoor air)

[a] Acenaphthylene is not listed in the RSL table, but based on its molecular weight (152.20 g/mole) and Henry's Law constant of 1.13×10^{-5} atm-m^3/mole, it is considered sufficiently volatile (source of data http://www.speclab.com/compound/c208968.htm).

[b] Benzo[g,h,i]perylene is not listed in the RSL table, but based on its molecular weight (276.34 g/mole) and Henry's Law constant of 1.6×10^{-6} atm-m^3/mole, it is not considered sufficiently volatile (source of data http://www.speclab.com/compound/c191242.htm).

[c] Phenanthrene is not listed in the RSL table, but based on its molecular weight (178.22 g/mole) and Henry's Law constant of 2.56×10^{-5} atm-m^3/mole, it is considered sufficiently volatile (source of data http://www.toronto.ca/health/pdf/cr_appendix_b_pah.pdf).

[d] Cyanide in soil is expected to be present in a nonvolatile form.

[e] Mercury in soil is expected to be present in a nonvolatile form, such as an inorganic salt.

Attachment (3)
Building Construction and Use Information

Main Building

Building construction, condition and use information can be useful in interpreting soil vapor sampling results in terms of additional attenuation to be expected from building materials or conduits that can enhance vapor migration. Some notable construction and condition features of the Main Building include:

- The building is currently used as a storage facility and light maintenance garage (vehicle wash).
- Personnel occupy the garage space of the building (lower exposed level) only as needed; one upper level office unit is occupied during business hours.
- The building does not have a basement.
- Small maintenance garage at west end of Main Building - At the time of site reconnaissance on January 27, 2010, inspection personnel noted cracks in the concrete (2-2.5 feet long) around several support posts, heavy pitting of the foundation slab, and the presence of a large sewer grate and expansion joints in the middle of the room were it appears that a pipe was installed below the concrete floor adjacent to this sewer grate. This garage (which houses the groundwater treatment system) contained a large front end loader/backhoe, pallets, office tables, benches and chairs and large shelving units making a complete inspection impossible. This garage appears to be have been added on to the Main Building at some time in the past.
- Large maintenance garage - At the time of the site reconnaissance in January 2010, inspection personnel noted no cracks or pits in the concrete slab. The slab appeared to be in excellent condition. Expansion joints were noted in the vicinity of support posts. Due the presence of multiple fleet vehicles, pallets, lockers, benches and chairs and large shelving units, and poor lighting, the entire floor could not be assessed. Cracks may be present under the shelving units, pallets and/or fleet vehicles.
- One 55-gallon drum labeled “recovered coal tar” and containing sorbent pads is located within the small maintenance garage near a work bench. The drum is less than a ¼ full.
- Utility feeders (gas, electric, sanitary sewer, water) come into the building on the south side from the main lines that run underneath Chicago Street. Records obtained from the City indicate these utilities are approximately 8 to 10 feet below grade (extimated approximate elevation of 585 ft or higher).
- There is a trench, measuring 12 inches deep by 120 feet long, that runs east to west inside the large maintenance garage. The trench is directly connected to the sanitary sewer by several drains and believed to be used as a drain for truck washing.
- There is one bathroom in the western portion of the building and four bathrooms in the upper office area all with sanitary sewer connections.

- Untreated and treated water discharge lines from the groundwater treatment system enter/exit the building on the west end.

Winter Building and Property

Some notable construction and condition features of the Winter Building include:

- The Winter Building is currently used as office space; the small building north of the Winter Building is owned by WPSC and appears to be used as storage with minimal occupancy.

- Personnel generally occupy the Winter Building between 8 AM and 5 PM from Monday through Friday.

- The building is slab on grade construction and does not have a basement or crawl space. Therefore, there are no office spaces below grade and no sump pump.

- Utility feeders (gas, electric, water, sanitary sewer) appear to come from the main lines that run underneath Chicago Street.

ENCLOSURE C

NRT'S RESPONSE TO USEPA'S DECEMBER 13, 2010 COMMENTS ON THE SUPPLEMENTAL RI ACTIVITIES USEPA, SUBMITTED JANUARY 28, 2011

NATURAL RESOURCE TECHNOLOGY
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Ms. Sheila Sullivan
Remedial Project Manager
USEPA, Region 5
77 W. Jackson Boulevard
Chicago, Illinois 60604-3590

January 28, 2011
(1530)

RE: Response to USEPA's December 13, 2010 Comments on the Supplemental RI Activities
Manitowoc Former Manufactured Gas Plant (MGP) Site, Manitowoc, Wisconsin
Wisconsin Public Service Corporation
WIN000509949

Dear Ms. Sullivan:

This letter provides responses to United States Environmental Protection Agency (USEPA) comments issued December 13, 2010 on the Supplemental RI Activities as presented in *Technical Memorandum No. 3*, submitted July 14, 2010. A revised *Technical Memorandum No. 3* will be submitted following USEPA's concurrence with these responses to comments.

For ease of review, USEPA's comments are provided (italicized and indented) and followed by the response to comment. A number of the comments are the same as those made for Integrys' South Station MGP site (Chicago) for which responses have already been provided. To maintain consistency and reflect concepts discussed in the December 17 technical meeting between Integrys Business Support (IBS) and USEPA, responses to like comments are referenced accordingly.

General Comments

1. *The Tech Memo includes tabulated soil and groundwater analytical data from prior remedial investigations (RI) that have not previously been evaluated by CH2M HILL or U.S. EPA. Further, the actual analytical data packages or data validation results are not included in the Tech Memo for evaluation. Validated data and associated summary tables should be included in the forthcoming RI report, including comparisons to the most recent soil and groundwater screening criteria. A site-specific risk assessment and the establishment of site-specific remedial action objectives (RAOs) are expected to define future remedial actions. However, if the most recent soil and groundwater screening levels (i.e., Regional Screening Levels [RSLs] for Chemical Contaminants at Superfund Sites) are not used for screening purposes, then there is a possibility that potential exposure pathways for individual contaminants of concern may not be properly evaluated at the RI stage, and therefore subsequent risk assessment activities may not focus on the proper areas of concern.*

   More basic, however is that the essential data are collected and evaluated in consideration of the risk assessment. While some of the data deficiencies are discussed in the SSWP and Tech Memo, the following are examples of overlooked sampling areas:

   - *The lateral extent of the oily product (see Figure 9 of the RI SSWP) has not been fully defined within Chicago Street and its utilities. Additional samples should be collected east of SB-96-7. Also a full evaluation (including vapor study) of the utility corridor in Chicago Street should be completed.*

   - *Revision I of the RI SSWP was updated and identified the disposal location of the dredge spoils resulting from the dredging of the navigation channel adjacent to the site <u>after</u> 1976. However, prior to 1976, it was stated that the disposal location of the dredge spoils was unknown. Since it is very likely that coal tar was excavated from the river bed, further research should be conducted to*

determine the location of the historic (pre-1976) dredge spoils. The location should be documented and sampled if necessary.

- *An additional water table well should be installed on the Winter property in the general location of soil boring SB122.*
- *An upgradient piezometer should be installed to fully define the degree and extent of contamination at depth. An appropriate location may be near MW-5 so that another well nest could be created.*

Response:

The use of RSLs is addressed in IBS's response to general comment #2.

Consistent with the response to comments for the South Station MGP site submitted to USEPA on October 7, 2010, relevant analytical data packages and data validation reports will be included as part of the RI Report. Of note, data packages and validation information is regularly submitted through the GEOS-data coordinator and has been attached to monthly progress reports to USEPA.

Bullet 1: One additional soil boring will be performed to collect soil samples east of SB-96-7 and west of MW-21T to further define the oily product and elevated benzene and naphthalene soil concentrations in the saturated zone. We note that monitoring well MW21T, with low to non-detectable groundwater concentrations, exists only 45 feet to the east of SB-96-7. Given this close proximity, and with the requested additional soil boring, the soil quality data in this area will be sufficient for remedial evaluations. As mentioned in Enclosure B of *Technical Memorandum No. 3*, preferential pathways of soil vapor migration outside of the identified areas of contamination through utility corridors are not likely based on site characteristics. The vadose zone in much of the site is composed of fill (sand) and native sand. However, because there are isolated clay layers in certain areas within Chicago Street, and to address this comment, a limited vapor study will be performed. The study will include soil gas samples within the utility corridor in conjunction with the borings requested and addressed under specific comment # 6. As always, borings/probes will be located where utilities will not be damaged and safety will be a priority.

Bullet 2: During preparation of the RI Site Specific Work Plan (SSWP), IBS searched historic records for information regarding disposition of dredge spoils prior to 1976 (SSWP Section 3.6.6). Details of the placement of pre-1976 dredge spoils are not available. Even if located, IBS does not agree that the suggested information regarding the placement and sampling of pre-1976 dredge spoils would yield useful results relative to site-specific concerns.

Bullet 3: MW18T is located within approximately 80 feet downgradient of SB-122, and MW1 is located 60 feet upgradient. Given the highly elevated concentrations in soil at SB-122, it is expected that remedial evaluations will focus on the unsaturated soil. Additional groundwater data at the area of highest concentration does not further inform the remedial options analysis considering that groundwater is not adversely affected immediately downgradient of SB-122. The need for and location for an additional groundwater monitoring well should be evaluated following completion of the additional soil borings discussed under the response to specific comment #6.

Bullet 4: An upgradient piezometer may prove beneficial for confirming flow direction and quality at depth. The vicinity of MW1 may be a better location. An optimal location for an additional upgradient piezometer will be

further evaluated (MW1, MW5 or an intermediate location) and the proposed depth and rationale will be presented in the revised *Technical Memorandum No. 3*.

2. *If contaminants and/or contaminant exposure pathways are not properly evaluated, ultimate site closure may be delayed to address outstanding issues. Therefore, it is in Integrys' best interest to screen soil and groundwater data against the most current RSL criteria.*

Response: Based on results from the December 17, 2010 meeting with IBS and USEPA, and responses to comments for the South Station MGP site submitted to USEPA on December 23, 2010, the multi-site screening level hierarchy will be amended to include the RSLs and site data rescreened with the new screening levels. A copy of the December 17, 2010 Meeting Summary (revised January 2011 to reflect USEPA comments dated January 21, 2011 for South Station) documenting discussions regarding the VI approach is attached for reference.

3. *Per discussions during the April 27, 2010 meeting at U.S. EPA attended by Integrys, U.S. EPA, and CH2M HILL, it was noted that the 2007 Risk Assessment Framework (RAF) prepared by Exponent did not contain the most updated screening criteria found in U.S. EPA's RSL. U.S. EPA acknowledged this information, but added that if site actions were based on generic screening levels, then the most recent screening levels (i.e., RSLs) should be utilized. U.S. EPA further noted that if future site actions are supported by site-specific risk assessment evaluations that are approved by U.S. EPA, then the site decisions will no longer be driven by the generic screening levels. Therefore, until such time as site-specific risk assessments and (RAOs) are established for each site, we recommend that all analytical data presented to the Agencies for review and evaluation should include comparisons to current RSL criteria for each medium and route of exposure, including any state criteria (applicable to each site) that may be more stringent than the RSL criteria. Revised data tables consistent with the comments in this memo are suggested. This approach will help to define potential areas of concern at the RI stage, and allow risk assessment activities to properly focus on those areas of concern.*

Response: See IBS's response to general comment # 2.

4. *The screening approach used to evaluate site groundwater data are outdated and should be revised. As noted in the 2007 RAF prepared by Exponent, the "state of practice in regard to evaluating the vapor intrusion pathway is evolving rapidly in the scientific and regulatory community. Therefore, the method used at each site will likely evolve with the state of the practice and will be described in the SSWP." In addition, the RAF notes that vapor intrusion (VI) issues will utilize "EPA guidance that is current at the time of evaluation." Therefore, tabulated risk-based groundwater screening levels presented in U.S. EPA's OSWER Draft Guidance for Evaluating Soil Vapor to Indoor Air Pathway from Groundwater and Soils (2002) are expected to be updated to reflect the most recent inhalation toxicity values as a component of the revised VI programmatic concept. The upcoming meeting to discuss VI screening levels and programmatic concepts will be helpful to agree upon VI assessment elements.*

Since the future onsite land use will be commercial/industrial (rather than residential), the U.S. EPA industrial air RSLs (U.S. EPA, 2010) should be used with U.S. EPA's generic attenuation factor (AFs) obtained from U.S. EPA's draft VI guidance (U.S. EPA, 2002). The default AF is 0.001 for groundwater. The air RSLs should be used with the default AF to calculate generic screening levels for groundwater that are protective of Indoor Air VI exposures.

Analytical data should be screened using a target risk level of $1x10^{-6}$ for identifying VOCs of interest for soil vapor sampling due to the uncertainties/variabilities in the screening levels and predicting indoor air concentrations from groundwater data. Data should be rescreened using a target risk level of $1x10^{-6}$ and

hazard quotient (HQ) of 0.1 per chemical. We recommend that all affected tables, attachments, and figures be modified accordingly.

For areas at the property boundary and beyond (or at onsite locations where a future unlimited use scenario is applicable), generic screening levels for groundwater that are protective of Indoor Air VI exposures on residential properties should be calculated using the U.S. EPA residential air RSLs. The groundwater plumes should be redrawn at the site boundary and where a residential scenario is applicable based on the updated risk-based screening values. If additional buildings are present within 100 feet of the updated plumes, further evaluation is recommended, including the possibility for subslab soil gas samples to be collected at those locations.

Per recent U.S. EPA VI guidance contained in the Fall 2010 white paper, the state of the VI practice is evolving, including the tiered approach found in the 2002 U.S. EPA Draft VI Guidance document. The Fall 2010 white paper states: "Finally, it is notable here and in the next section that the sequence of screening in the 2002 Draft VI Guidance was generally intended to begin with sampling near the subsurface source (Tier 2), then progress closer to the overlying building, and ultimately, to include indoor air sampling (Tier 3) (i.e., an "indoor air last" approach). However, experiences since 2002 illustrate the value of collecting indoor air samples earlier in the investigations, including the more rapid and direct assessment of the quality of indoor air. Benefits can also include improved public relations and clearer communication of the results, both of which can improve the opportunities for meaningful public involvement. These observations suggest that while valid, the "indoor air last" approach of 2002 is being considered for updates that will allow more flexibility in the sequencing of subsurface and interior/indoor sample collection." The white paper can be found at the following link: (http://www.epa.gov/oswer/vaporintrusion/documents/review_of_2002_draft_vi_guidance_final.pdf

In addition, the U.S. EPA Region 5 Vapor Intrusion Guidebook Dated October 2010 states that "U.S. EPA observations and experiences since 2002 have increased awareness of the degree of variability and uncertainty involved with predicting indoor air concentrations using external measurements and has generally shown the inappropriateness of the single-line-of-evidence "screen-outs" suggested under Tier 2 in the 2002 U.S. EPA Draft Guidance."

Therefore, these recent U.S. EPA guidance documents should be considered in the evaluation of the Manitowoc groundwater and soil data (and the location of subsurface residues) and the planning for additional VI evaluations. This is consistent with the Integrys RAF which notes that VI issues will utilize "EPA guidance that is current at the time of evaluation."

It should also be noted that the WDNR has recently completed a draft guidance document on vapor intrusion (see http://dnr.wi.gov/org/aw/rr/technical/RR800-draft.pdf). This Wisconsin document should also be reviewed within the context of the most recent VI guidances.

Response: Regarding the use of RSLs, see IBS's response to general comment #2.

Regarding the use of a target risk levels for identifying VOCs of interest for soil vapor sampling, results of screening site data against the $1x10^{-6}$ or hazard quotient (HQ) of 1 target risk levels will be highlighted in the revised *Technical Memorandum No. 3*. This includes screening for site-specific contaminants of potential concern (COPC). This approach is consistent with the results from the December 17, 2010 meeting with IBS and USEPA, and responses to comments for the South Station MGP site submitted to USEPA on October 7 and December 23, 2010,

Regarding the use of residential screening criteria for groundwater that are protective of Indoor Air VI exposures on the property and beyond, IBS will develop groundwater screening criteria using the industrial/commercial and residential RSLs, USEPA's generic attenuation factors (AF), and the temperature adjusted Henry's Law Constants. Groundwater on site will then be re-screened and residential buildings falling within the critical distance of the groundwater plume will be evaluated for VI exposure. This approach was agreed to by USEPA in the South Station comments dated November 9, 2010. Also, as discussed in the meeting on December 17, 2010 with USEPA and IBS, site-specific AFs may also be developed and used based on the presence of petroleum hydrocarbon COPCs and site-specific conditions.

Regarding the comments on the current state of the practice and consistent with the concepts discussed in the December 17 meeting:

- As discussed in the December 17, 2010 meeting, the 100-foot critical distance is likely an overestimate for cases where petroleum hydrocarbons are the COPCs given their known biodegradability. The appropriate critical distance for the site and the MGP-related residuals will be established in the revised *Technical Memorandum No. 3* using robust evidence and reference to published information such as recent WDNR and ASTM guidance, which cite critical distances of 30 to 35 feet as appropriate depending on site specific conditions.

- Buildings within critical distance of contamination will be evaluated for vapor intrusion to indoor air using multiple lines of evidence established through the tiered evaluation outlined in current guidance.

- Subslab soil gas or indoor air sampling at peripheral areas of the plume where there is low potential for risk will not be proposed if other less-intrusive data collection methods (e.g. subsurface soil gas sampling) can sufficiently characterize the VI pathway. This approach is consistent with the referenced WDNR guidance.

- Other practical aspects of the WDNR guidance, such as the distinction between large commercial/ industrial and residential buildings for determining AFs, will be evaluated and integrated into the revised *Technical Memorandum No. 3*.

5. *Based on the above observations, we recommend that Integrys re-evaluate the proposed sampling plan based on the location of impacted groundwater and subsurface residues that may not be protective of indoor air vapor intrusion.*

Response: *Technical Memorandum No. 3* will be modified based on responses to comments provided herein.

Specific Comments

1. *Page 2, Soil Vapor Sampling Approach – The assessment is focused on the existing buildings and current conditions. Describe how future indoor air VI risks at existing and newly constructed buildings will be evaluated. Institutional controls for future buildings must be evaluated in the Feasibility Study.*

   The statement "soil vapor sampling exterior to buildings… is generally preferred to sub-slab sampling since it is less intrusive to building occupants" is misleading; it may be more convenient for the company responsible for the sampling, but does not give more accurate results for potential indoor air impacts and may underestimate concentrations under the building slab (where vapors may have accumulated over time). This sentence should be deleted.

Response: As discussed under the response to general comment #4, the appropriate critical distance for the site and the MGP-related residuals will be established using robust evidence in the revised *Technical Memorandum No. 3.* Buildings within the established boundary will be evaluated for vapor intrusion to indoor air. Institutional controls for future buildings will be evaluated in the Feasibility Study. This approach is consistent with the results from the December 17, 2010 meeting with IBS and USEPA, and responses to comments for the South Station MGP site submitted to USEPA on December 23, 2010,

Technical Memorandum No. 3 will be modified with the suggested deletion.

2. *Page 3, Soil Vapor Sampling Rationale and Locations – Soil vapor samples should be collected on the adjacent Braun Property since the property is within approximately 75 ft of very high concentrations of naphthalene and impacted soil vapor may have migrated onto the Braun property.*

Response: IBS will re-evaluate the need for collecting soil vapor samples on or near the adjacent Braun Property. Evaluation of vapors in the direction of the Braun Property will be performed based on the proximity of the estimated groundwater plume (as shown on Figure 3 of *Technical Memorandum No. 3*). For this evaluation, the extent of the plume will be updated based on the revised groundwater screening levels protective of indoor air (see response to general comment #4).

A critical distance of 30 feet will be used to determine the need for vapor probes on the Braun Property or the adjacent street right-of-way. Per the WDNR guidance, investigating the vapor pathway is appropriate when free product with the potential for off-gassing vapors is present within 30 feet (horizontally or vertically) of a building foundation. Use of a 100-foot critical distance is recommended for sites where chlorinated VOCs are of primary concern. As stated previously, this 100-foot buffer distance is too conservative for petroleum-type contaminants that bioattenuate. IBS will also employ the 30-foot critical distance for the groundwater evaluation,

3. *Page 4, Winter Building and Vicinity – Due to the construction of the Winter Building atop the tar holder and the elevated concentrations in the subsurface, subslab soil gas samples should be collected rather than exterior soil gas samples.*

Response: As discussed in the December 17, 2010 meeting, soil vapor probes exterior to the building may be used on a site-specific basis. In the case of the Winter Building, the source (gas holder) is large and the building footprint is entirely within the footprint of the holder base. In addition, an asphalt parking lot, serving as a cap, is present around the building and within the footprint of the holder base. Given these conditions, the vapor environment under the asphalt cap mimics the vapor environment under the Winter Building floor slab and IBS proposes to begin sampling under the asphalt cap. An additional vapor probe is proposed under the asphalt cap to assess potential subsurface heterogeneities and compliment proposed vapor probe SV-108, such that there will be two probes on the east-northeast side (near the building corners), plus one on the northwest side and one on the southeast side, for a total of four probes. Two to three soil vapor sampling events will be conducted at the four vapor probes adjacent to the Winter Building. IBS will evaluate the need for sub-slab sampling at the Winter Building based on the results of this investigation.

4. *Page 5, Soil Vapor Installation and Sampling Methods – How will the size of the canister be determined? We recommend that it be determined by comparing laboratory reporting limits with target risk-based screening levels.*

Response: Consistent with the response to comments for the South Station MGP site submitted to USEPA on October 7, 2010, the size of the canister used for sampling will be determined by comparing laboratory reporting limits with screening criteria. Available equipment options also need to be considered. The text will be modified to state this.

5. *Page 5, Sample Analysis – The list of analytes for the VI investigation should not be limited to those indicated. The analytical parameters should be those chemicals in groundwater exceeding indoor air VI target risk levels based on $1x10^{-6}$ and HQ of 0.1 (to account for potential cumulative effects during the screening step). In addition, the analytes should include those chemicals detected in subsurface residual material.*

Response: The COPC list for this for this site will be re-evaluated. Chemicals detected related to the site (in groundwater or vadose zone soil) will be initially selected as VI COPCs based on their volatility and toxicity. COPCs will then be screened against the revised applicable criteria as described in responses to General Comments #2 and #4. This approach is consistent with that approved by USEPA in comments for the South Station site dated November 9, 2010 and the concepts discussed in the December 23, 2010 meeting with USEPA and IBS.

Regarding the use of target risk levels, see response to General Comment #4.

6. *Page 5, Soil Borings – We question why the word "possibly" is used in the first sentence. Soil borings should be installed on the property to the west of the Winter property since soil has not been delineated in that direction. In addition, soil has not been delineated under Chicago Street or towards the Braun property. Additional soil borings (for delineation purposes) should be added to the proposed scope of work.*

Response: Since the historic use of the property to the west of Winter property was residential during the time the MGP was in operation, it is plausible that naphthalene impacts (possibly buried under the holder from filling or disposal) do not extend onto this property. From review of historic drawings, this property boundary has not changed over time and a boring placed on the property boundary may sufficiently define the extent. In that case, the need for step-out borings beyond the west property boundary will be re-evaluated in the field and may not be needed. In other words, we are planning to use a dynamic sampling approach. The need for additional borings in Chicago Street will also be evaluated in conjunction with proposed vapor probe locations (general comment #1) and a sampling approach will be presented in the revised *Technical Memorandum No. 3*.

7. *Page 6, Elimination of Proposed Well MW-22 – We disagree with the proposal to eliminate monitoring well MW-22. The proposed well should be moved to the Braun Property since groundwater has not been delineated in the direction of the Braun Property and free product is present in groundwater within approximately 75 ft.*

   It should also be noted that high naphthalene concentrations were found in the soil at depths of 3-5 feet in the general vicinity (SB-95-3) of proposed MW-22. Additional at-depth soil sampling at that location should be conducted to determine the extent of soil contamination. Installation of MW-22 would help establish if MGP residuals have impacted an off-site property.

   Updated target risk-based concentrations should be used to screen groundwater for potential indoor air vapor intrusion.

Response: Monitoring well MW-22 will be installed on the Braun Property or preferably in the street right-of-way in the direction of the Braun Property to define the groundwater plume extent in that direction and for vapor intrusion evaluation. As mentioned in the response to Specific Comment #2, the need for a vapor probe(s) in the direction of the Braun Property will also be evaluated.

Regarding the general vicinity of SB-95-3, the naphthalene concentration at 3 to 5 feet was 19 mg/kg, which is not "high" relative to the current RSL range for carcinogenic and non-carcinogenic screening values for industrial land use. Rather it is on the low end of the risk range. Given this fact, the data for nearby SB95 borings, and the existing groundwater data, the extent and magnitude of soil impacts at this location is sufficiently defined for purpose of feasibility study evaluations.

Target risk-based concentrations for groundwater that are protective of Indoor Air VI exposures will be developed as described in General Comment #4.

8. *Page 7, Schedule – Please provide an updated schedule.*

Response: An updated schedule will be provided upon approval of revised *Technical Memorandum No. 3*

9. *Table 3 – Use updated risk-based screening levels for protection of indoor air to delineate groundwater impacts.*

Response: Target risk-based concentrations for groundwater that are protective of Indoor Air VI exposures will be developed as described in General Comment #4.

10. *Table 6 –Update the parameters and add sampling locations (see above comments).*

Response: The document, including Table 6, will be modified according to the responses presented.

11. *Enclosure B – Based on the above comments, modify all pages accordingly.*

Response: The document, including relevant sections of Enclosure B, will be modified according to the responses presented.

Please contact Mr. Naren Prasad of IBS at 312.240.4569 if you should have any questions or require additional information.

Sincerely,

NATURAL RESOURCE TECHNOLOGY, INC.

Julie A. Zimdars, PE
Project Manager

Sarah L. Meyer
Senior Scientist

Attachments: December 17, 2010 Meeting Summary (revised January 2011), IBS MGP Sites VI Approach

cc: Ms. Annette Weissbach, WDNR
Ms. Catherine Schripsema, USEPA contractor (via email)
Ms. Emily Jennings, USEPA contractor (via email)
Mr. Charlie Menzie, Exponent (via email)
Mr. Mike Kierski, Exponent (via email)
Mr. Brian Bartoszek, IBS (via email)
Mr. Naren Prasad, IBS (via email)

[File:\1530 Response to Suppl RI Comments final.doc]

DECEMBER 17, 2010 MEETING SUMMARY
(REVISION 1, JANUARY 27, 2011)
INTEGRYS BUSINESS SUPPORT, LLC (IBS) MANUFACTURED GAS PLANT (MGP) SITES VAPOR INTRUSION (VI) APPROACH

ATTENDEES:

Joan Tanaka, Ross del Rosario, Sheila Sullivan, and TaNaisha Lee, United States Environmental Protection Agency (USEPA)
Loren Lund, David Klatt, Emily Jennings, and Barry Selcoe (phone), CH2MHill
Brian Bartoszek and Naren Prasad, IBS
Jennifer Kahler and Sarah Meyer, Natural Resource Technology, Inc. (NRT)
Mike Kierski, Exponent

1. Opening Presentation

IBS and NRT present a slide presentation describing the past, present and future of the IBS multi-site VI approach. See attached agenda for topics covered in the presentation.

2. Discussion of IBS Multi-Site VI approach

Following the presentation, the group discussed specific elements of the presentation and agreed on major elements of the approach and a path forward. The major discussions and decisions are outlined below.

Screening Levels and Data Evaluation

- It was agreed that the most current list of USEPA Regional Screening Levels (RSL) will be used to screen sites. State values (e.g. Illinois Tiered Approach to Corrective Action Objectives [TACO]) will be used if an RSL is not available.
- If screening levels (RSLs) change during the Remedial Investigation (RI) period, then an analysis of the change in screening levels can be done during the Feasibility Study (FS).
- It was agreed that the hazard quotient (HQ) of 1 will be retained for screening of non-carcinogens in VI assessments, and that, as described in the presentation, a cumulative effects analysis check will be done using the entire data set if all detected non-carcinogenic analytes have an HQ of less than one individually. This will be the first step in the human health risk assessment.

Site-Specific/Miscellaneous Issues Discussion

- USEPA confirmed that anticipated land use should drive the selection/use of institutional controls.
- It was agreed that IBS will prepare a figure for each work plan that shows the locations of former structures and contaminants, and where the VI samples will be collected.

Sampling Approaches

- It was agreed to use multiple lines of evidence in VI evaluations moving forward. The lines of evidence required would differ depending upon the scenario at a site. Two different general scenarios were laid out for example.
    - **Scenario 1: Groundwater contamination near or beneath building** (but no primary vadose zone source). At a minimum, groundwater AND soil gas data as evidence would be required by USEPA for the VI evaluation. Top of water table sampling (representing the upper range of vapor concentrations) and multiple soil gas samples (more if soil is heterogeneous) could be enough to prove the pathway is incomplete.
    - **Scenario 2: Vadose zone source near or beneath building.** At a minimum, the following lines of evidence should be considered. USEPA stressed the importance of considering the characteristics of the **MGP residuals that are known or suspected to be near or under the building** in relation to the **size of the building**.

- When the source (primary release) is present near or under a building, subslab sampling is expected to be performed along with the other common lines of evidence (e.g., groundwater data, deeper soil gas data, etc.).
- In the case where the source (e.g., gas holder) is both near or under the building and outside of the building footprint; the building is small; the source is the same inside and outside the building footprint; and a parking lot abuts the building, USEPA might make an exception to the first bullet. In this case, sampling beneath the parking lot slab outside the building might be appropriate to predict what may be under the building. It was agreed that this would be handled on a site-specific basis.
- USEPA stressed that if samples are collected outside of a building footprint, they must be sampling the same source that is potentially affecting/near/underneath the building, and the conditions outside the building must be similar to conditions under the building. Site-specific conditions may preclude the use of soil gas sampling conducted outside a building footprint to approximate sub-slab soil gas sampling.

- **Indoor Air Sampling:** USEPA recommended that IBS establish multiple lines of evidence for VI assessment and that **collecting subslab samples before proceeding to indoor air sampling is acceptable** and each sampling plan will be considered on a site-specific basis.

Attenuation Factors (AF)

- It was agreed that the rate of degradation under a building can vary spatially based on the amount of available oxygen; with the edges of the building foundation generally have more available oxygen. This must be considered in evaluation and use of AFs (see spatial variability discussion below).
- USEPA suggested that although the generic AFs within the USEPA 2002 guidance should be used for initial screenings, IBS should make a robust argument that AFs for petroleum hydrocarbons are greater than for chlorinated compounds. USEPA suggested using recent literature to support the difference in attenuation factors.

Variability and Critical Distance

- It was agreed that spatial variability in subsurface conditions can have a significant influence on the variability of soil gas contamination beneath a building (i.e., soil gas or subslab vapor) and will be considered.
- USEPA recommended that when subslab sampling is required, the samples should be collected so that they represent the contamination under the building, despite variability. USEPA suggested collecting samples in areas where impact from the source is estimated to be greatest.
- Regarding **critical lateral distance** from the source for collecting VI data, USEPA stated that the ASTM standard critical distance for petroleum hydrocarbons is 35 feet (lateral); the critical distance discussed in USEPA's 2002 guidance is 100 feet and based primarily on chlorinated compounds. USEPA again recommended that samples should be collected in areas where impact from the source is estimated to be greatest (i.e. above the source).
- It was agreed that **temporal variability** is a major factor in any site medium (soil, soil gas, groundwater, etc). USEPA suggested performing VI sampling/analysis in more than one season, or building in a "buffer factor" to results from one season to account for likely temporal variability. A buffer factor can be determined from estimating the limits of temporal variability that have been documented at other sites. USEPA recommended that a defensible buffer factor may be 5, and no more than 10, based on the current research studies that are available.

Attachments:
Integrys VI Presentation Agenda for December 17, 2010

ENCLOSURE D

CONDITIONAL APPROVAL OF THE TECHNICAL MEMORANDUM NO. 3 ENTITLED "SUPPLEMENTAL RI ACTIVITIES–FORMER WISCONSIN PUBLIC SERVICE CORPORATION'S MANITOWOC MANUFACTURED GAS PLANT SITE, MANITOWOC, WISCONSIN", DATED NOVEMBER 9, 2011

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604

November 9, 2011

Mr. Naren M. Prasad, P.E., MPH, LEED AP
Senior Environmental Engineer
Integrys Business Support, LLC
130 East Randolph Drive, 22nd Floor
Chicago, Illinois 60601

Re: Conditional Approval of the Technical Memorandum No. 3 entitled "Supplemental RI Activities– Former Wisconsin Public Service Corporation's Manitowoc Manufactured Gas Plant Site, Manitowoc, Wisconsin"

Dear Mr. Prasad,

The U.S. Environmental Protection Agency (EPA), with assistance from the Wisconsin Department of Natural Resources (WDNR) has reviewed Technical Memorandum No. 3 entitled "Supplemental RI Activities–Former Wisconsin Public Service Corporation's Manitowoc Manufactured Gas Plant Site, Manitowoc, Wisconsin" (dated July 14, 2010). The agencies identified some critical issues (i.e., issues that must be addressed before the EPA will approve the document) to Integrys Business Support LLC (IBS) in a letter of September 14, 2011 (see attached). A conference call was held between the parties and their consultants on September 28, 2011 to resolve the issues. This letter incorporates the agreements resulting from the call in order to provide you with conditional approval of the subject document.

The call included discussion of vapor intrusion (VI) regional screening levels (RSLs) and EPA policy with respect to tiered hierarchical use of cancer and noncancer toxicity-based screening values for naphthalene and ethylbenzene, which will impact the Manitowoc Tech. Memo 3 as well as the Marinette Site-Specific Work Plan Rev. 1. EPA Region 5 bases its screening levels on cancer endpoints for the chemicals, instead of the less conservative noncancer toxicity endpoints. IBS believes the noncancer endpoint should be the basis for the screening levels. While this issue was not resolved during the call, IBS subsequently indicated that it will use the cancer endpoint-based RSLs for the two chemicals.

The following critical issues in bolded font pertain to Tech Memo #3. Their resolution or agreed-upon strategies for moving forward as per the September 28, 2011 call follow respectively.

In general, EPA and WDNR find IBS's responses to our comments to be technically acceptable. IBS should proceed with the modifications discussed in its January 28, 2011 response to EPA's comments. In addition, resolutions or enhanced text to the issues below should also be added to the document. Below are EPA's comments in bold font with the resolutions following in normal font.

General Comment #1

- **Present the sampling approach for the limited vapor study proposed for the Chicago Street utility corridor;**

IBS will conduct a vapor investigation based on the utility corridor in Chicago Street, including the sanitary and storm sewers. It will perform additional soil borings in Chicago Street and will also install probes near the storm inlet and MW-14, focusing on areas where there is likely to be a vapor intrusion (VI) problem. Based on sampling results, the sampling will radiate outward from around the manholes in the corridor. A technical memo explaining this approach will be submitted to EPA.

- **Present the rationale and construction details for the proposed upgradient piezometer.**

  IBs will install an upgradient piezometer and will provide this information to EPA.

General Comment #2, #3, and #4

- **Re-evaluate all analytical data using the most current RSL criteria for each medium and route of exposure.**

  IBS will re-evaluate all data using current RSLs and will re-evaluate the COPC list based on potential VI exposures.

General Comment #4

- **Establish an appropriate critical distance for the Site and the MGP-related residuals using robust evidence;**

  As one line of evidence, IBS will use a critical distance of 35 feet for VI consideration, consistent with the discussions held on December 17, 2010. Buildings of interest for the VI study will be identified based on multiple lines of evidence, with one being the critical distance between groundwater plumes/residual materials/tar holders and the buildings.

- **Re-evaluate the buildings within critical distance of contamination for vapor intrusion to indoor air using multiple lines of evidence;**

  IBS will perform a VI investigation of the WPSC-owned buildings within the critical distance for VI to indoor air using multiple lines of evidence.

- **Evaluate and integrate practical aspects of WDNR guidance, including the distinction between large commercial/industrial and residential building for determining AFs;**

  This will be addressed in the revised document.

- **Re-evaluate the proposed sampling plan based on the location of impacted groundwater and subsurface residues that may not be protective of indoor air vapor intrusion.**

  This will be addressed in the revised document.

Specific Comment #2

- **Re-evaluate the need for collecting soil vapor samples on or near the Braun Property, including updating the extent of the plume based on the revised groundwater screening levels protective of indoor air.**

This will be addressed by conducting a VI investigation on or near Braun Property and installing a monitoring well (MW-22) adjacent to Braun Property.

Specific Comment #5

- **Re-evaluate the COPC list for the Site.**

IBS will re-evaluate all data using current RSLs and will re-evaluate the COPC list based on potential VI exposures. (See General Comment #2, 3, 4 above).

Specific Comment #6

- **Present a dynamic sampling approach for soil borings on or near the Winter property.**

A VI investigation of the Winter building will be conducted and additional soil borings will be added to the sampling plan.

Specific Comment #7

- **Include the location for proposed MW-22 on or near the Braun property.**

This will be addressed in the revised document (see Specific Comment #2).

In summary, EPA is satisfied that the critical VI investigation issues are being, or will be addressed by IBS as documented in this letter. Therefore, pursuant to Administrative Order on Consent dated May 5, 2006 (Docket No. V-W-'06-C-847), Section X (U.S. EPA Approval of Plans and other Submissions), Paragraph 39, and by receipt of this letter, EPA is conditionally approving the Manitowoc Technical Memorandum No. 3 - "Supplemental RI Activities–Former Wisconsin Public Service Corporation's Manitowoc Manufactured Gas Plant Site, Manitowoc, Wisconsin" Rev. 0. Under this conditional approval, EPA expects that the agreed upon supplementary information discussed above will be incorporated into the Work Plan document, as well as other necessary information agreed to by IBS in its responses to EPA comments (dated January 28, 2011).

Given that these revisions will take time, I am conditionally approving the document in order for field work to begin, with the understanding that the above-mentioned changes will be made to produce a revised document in the future. When you and your consultants have had a chance to review the necessary revisions, we will discuss a time frame for submitting the revised document.

Please do not hesitate to contact me if you have any questions. Please call if you have any questions. Thank you.

Sincerely,

Sheila A. Sullivan
Project Manager
U.S. EPA Region 5
Tel: (312) 886-5251

Attachment

cc: Jennifer Kahler, Natural Resources Technology
Annette E. Weissbach, WDNR
Catherine Schripsema, CH2M Hill